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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 10.] [1913.

LVIII.—SOME NOTES FROM A WEST INDIAN CORAL ISLAND.

T. M. Savage English.

These notes have been made during a three years' residence in Grand Cayman, an island of the British West Indies, 17 miles long, 1 to 6 miles wide, 19° north of the Equator, and in the track of the ocean current from the Eastward which afterwards becomes the Gulf stream.

This island has a comparatively dry climate with irregular rainfall, a temperature ranging between a few degrees above 90° and a few degrees below 60°, and well-marked summer and winter, the means of February and August differing by about 8° ; a climate which seems to suit *Vitis vinifera* and *Ficus carica*. *Sambucus nigra*, perhaps the most adaptable of all flowering plants, becomes evergreen and flowers several times a year but seldom if ever ripens seed. And out of a large number of British wild flowers, which the writer has tried to grow from seed brought from the south of England, only two, *Sinapis tenuifolia* and *Alisma plantago*, have continued to the second generation, when *Sinapis* was finally destroyed by caterpillars of the local " white " butterfly. Some plants of *Alisma* are still alive, putting out leaves, very much smaller than those of their ancestors, every three or four months ; but not one of this generation has flowered.

Grand Cayman is a typical " coral island " nowhere more than 30 or 40 feet above sea level and, being entirely composed of porous rock, practically devoid of fresh water except for a few days or at the most weeks after heavy rain when the mud at the bottom of some of the depressions in the almost universal rock is covered by enough water to maintain a scanty aquatic flora, including *Sagittaria, Typha, Jussiaea, and Ceratophyllum*. *Nymphaea ampla* which occurs in a few places is very possibly of human introduction and in any case is likely to be exterminated before long by cattle. Any hole in the rock deep enough to reach sea level holds brackish or more probably salt water which as a rule rises and falls with the tide ;

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and it is noticeable that not only do many of the Cayman plants, *e.g.*, *Hippomane Mancinella*, *Portulaca oleracea*,* *Swietenia Mahagoni*, *Thrinax argentea*, Mart., grow where their roots are sometimes covered by salt water (the extreme range of ordinary tides is about 2 feet), but that land birds such as *Dendroeca* are common among the mangroves miles from any fresh water except occasional dew or rain on *Rhizophora* or *Laguncularia*. The other "mangrove" *Avicennia*, which exudes brine from its leaves, generally has leaves and twigs "frosted" and glistening with salt crystals and not even a lichen, far less an orchid, seems able to exist on it, though *Schomburgkia Thomsoniana*, the common orchid of Grand Cayman, is frequent on *Laguncularia* and is occasionally to be found on old trees of *Rhizophora*.

A snake, *Ungulia maculata*, seems quite at home in salt water among these trees, as do water beetles and water boatmen. Dragon flies too abound and go through their metamorphoses in the sea. More than this the almost perpetual sea breezes which sweep the island, and give it an ideal climate from the human point of view,† bring with them so much spray from the reefs that wire mosquito netting, galvanized copper, even phosphor-bronze, has a lifetime if anything shorter than that of the "butterfly net" variety; and "staghorns" surmount every tree at all above the general level of the bush.

So it will be seen that Grand Cayman is by no means a suitable place for the establishment of any organism at all intolerant of salt, of course in those parts of the island where the surface is more than a foot or two above the level of high tides, where there is some soil, and where there is a sufficient extent of "bush" to give shelter from the sea breeze, conditions are more favourable, and seeds of non-maritime plants brought by birds or the wind have some chance of growing and getting established.

Passiflora cuprea, *L.* has apparently been brought by a bird within the last few years and is certainly being spread rapidly by this means. It seems to have been unknown to the islanders until lately and it is most unlikely that they would not have had knowledge of and a name for a plant, such as this, with conspicuous flowers and a comparatively eatable fruit.

Seeds brought by the sea no doubt have many more difficulties to surmount than if they come through the air, but want of opportunity is not one of them. The quantity of living seed afloat at this western end of the Caribbean Sea must be immense, for it is hardly possible to examine more than a few feet of the windward beaches of Grand Cayman without finding a seed of some sort; leguminous, probably, if it is not one from a Manicaria palm, though there are plenty of others.

Other jetsam includes electric light bulbs, occasionally in perfect order, but, as it is impossible to say where they have come from, of no particular interest; and bottles, which are sometimes more instructive. Recently two have contained messages; one, most unfortunately undated and only partly legible, was from Ceará in

* This is able to survive complete submersion by at least four successive tides.

† The death rate of Grand Cayman is one of the lowest in the world—below 8 for the last 3 years.

Brazil; the other, which gave date, latitude and longitude, had not travelled so far, having been dropped overboard from a local vessel about 60 miles to the E.N.E. six days before it was found on the beach. It was forwarded in time to be "news," though it was merely to say that its writer would not be home so soon as he had expected to be.

Bamboos, of which there are very few living in Grand Cayman, and trees of larger size than any locally grown, and in comparatively fresh and perfect condition, come ashore fairly often, and suggest a means of transport for various forms of life—most probably from Cuba.*

Live cocoanuts are not frequent—perhaps one a year to each mile of beach—but many more are no doubt picked up floating between the reef and the shore by fishermen and others. Manicaria nuts are very abundant. The islanders call them "sea-cocoanuts" (cf. *Lodoicea* from the Seychelles) and sometimes eat them, though they are considered, and probably with good reason, to be indigestible. Occasionally perfect fruits are found, but no "sea-cocoanut" has ever been known to germinate, and there is not a tree of it in the island.

Presumably the reason is to be found in the time taken in transit from Trinidad, or from wherever in South America these nuts may come. In a few cases signs of germination are visible when the nuts are opened, so it may be that this starts before or very soon after the commencement of the sea voyage, and is fatally checked by absorption of salt water. There is one known instance, and apparently one only which will bear investigation, of a plant having established itself unaided from sea-borne seed in Grand Cayman. This is *Cassia lineata*, now fairly common in places on the south side of the island and locally known as "storm weed."

It was first found soon after one of the notable hurricanes; some say in 1876, others in 1903, but it is agreed that it was unknown before and was noticed at once because it seemed to be a good garden flower.

Some grasses are said to have appeared after hurricanes, but on investigation it would seem that they appeared in quantity rather than for the first time, occupying ground where "bush" had been destroyed; there is some uncertainty too as to which particular grasses they are.

A small colony of *Ipomoea acetosifolia*, a plant which the writer has only seen in this one place in Grand Cayman, extending along about a hundred yards of shore from the remains of a pile of debris left by the 1903 hurricane, may very possibly be derived from a seed thrown up then; but the evidence, of course, is only presumptive. As it would also have been concerning a single plant of *Sophora tomentosa*, evidently some years old, flowering and about to ripen seed, which unfortunately disappeared in the heavy sea resulting from the near passage of the hurricane of November, 1912. It was new to the islanders, and they can give a name to almost anything that grows in the bush.

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* The Cayman reptiles seem on the whole to be of Cuban rather than Jamaican origin.

It is only after a hurricane has caused the sea to be exceptionally high that any seed is likely to be left far enough up the beach to have much chance of establishing itself on an island such as this, where no earthquake has ever been recorded; for, though there seems to be sufficient evidence that Grand Cayman is being steadily, and from a geological point of view rapidly, lifted up, this elevation can hardly be rapid enough to have much effect on the establishment of new plants.

Signs of this elevation are to be seen on the South side of the island where there is a flat topped reef of solid coral rock long since dead which is said to have been habitually passed over by canoes within living memory though it is now impassable. Again in the South West where a rock which is said to have been used in the early seventies of the last century as an ordinary launching place for canoes is now two feet or so too high above the ordinary tide level for this to be done with any safety. Further evidence is afforded in various places where patches of *Rhizophora* are gradually dying out and being replaced by more terrestrial forms—often by *Cereus*; in the gradual disappearance of sandy beaches and exposure of the rock beneath and in the continued existence of Grand Cayman itself. For, if a lowlying coral island, such as this, is to be kept above water, steady elevation seems necessary in order to balance the erosion due to tropical sunshine, sea breezes, rain and vegetation, which between them soon give to hard* coral rock exposed to their influence very much the appearance, on a large scale, of a lump of sugar taken out of hot tea. There is also the erosion due to the action of the water in and from mangrove swamps, which in a short time dissolves even such massive shells as those of *Strombus*† and planes down the underlying rock to a more or less flat surface showing excellent sections of its fossil shells; harder lumps being left here and there as rugged "islands"—to disappear more slowly.‡

This elevation can perhaps be satisfactorily accounted for by the inward and ultimately upward thrust of the ever growing wall of coral debris on the seaward face of the reef. Seeing then that it may only be four or five times in a century that seeds are likely to be left sufficiently out of the reach of ordinary high tides to be able to do much more than start their growth before they again find themselves in salt water, and that even so they must in most cases be able to grow in a soil which is to a large extent composed of calcareous sand, it is small wonder that the immense number of seeds thrown ashore alive should produce comparatively few seedlings. And as soon as a seedling begins to show itself it is exposed to attack by land crabs.

Two species are particularly destructive in Grand Cayman, *Cardisoma guanhumi* and *Gecarcinus ruricola* (?). The first, being the

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* Much of this rock is hard enough to make sparks from steel.

† A crab shell only lasts a few weeks.

‡ It is interesting in this connection to compare the account given of the erosion on Little Coco in *Natural History Notes from H.M.I.M. Survey Steamer "Investigator" No.* 25. *The vegetation of the Coco Group. By D. Prain* in the *Journ. Asiatic Soc. Bengal LX*, Pt. II. No. 4, 1891, pp. 288 et seq.—Ed.

edible crab of this part of the world, is known simply as *the* crab. It seems to be found all over the island and grows to a considerable size, an old male being sometimes as much as 6 inches across and having its larger claw no less than 14 inches in length from its junction with the body to the end of its "jaws," while these become so bowed that when they are shut a space as much as 2 inches across and 4 inches in length may be enclosed, little more than the actual points meeting.

The female has claws much smaller than those of the male, more even in size, and apparently more destructive. She seems to be just as terrestrial when she is carrying her minute eggs, which may number two millions or more, as she is at other times, though she is said to go into the sea to wash them off when they are about to hatch.

These crabs are generally clay coloured varying to fairly bright orange or to grey, while some are brilliantly blue.

They are great burrowers, as a rule nocturnal, in any case seldom appearing while the sun is shining or when the weather is dry, and are as omnivorous as anything that lives—cannibals too and wholesale devourers of the smaller species.

In places where they abound nothing is safe from them. They will take into their holes things for which they cannot conceivably find a use—a knife for instance or a pocket compass. They will eat the eggs from under a sitting hen, if not the hen herself, as readily as the leaves of seedling cocoanut trees, and of these from 6 to 10 per cent. have to be replaced if they are planted in newly cleared ground before the crabs have been very thoroughly thinned out. They are responsible for frequent patches of bare soil in the "bush," which get covered with vegetation when the crabs are gone. During the drier months of the early part of the year, they go underground to change their shells and add to their destructiveness by barricading the mouths of their holes with masses of sticks and rubbish like jackdaws' nests, nipping off or rooting up saplings as much as three quarters of an inch in diameter for the purpose. These holes always seem to reach water and make excellent and much used breeding and hiding places for mosquitoes, while if they are at all deep the salt mud which is perpetually being brought up from them ruins what would otherwise be excellent soil for some distance around their entrances. Fresh water seems to be rapidly fatal to this crab. Before it was made proof against them they were continually getting into a cemented rain-water cistern belonging to the writer and, so long as they were alive, were hard to get out from a depth of 5 feet. But in less than an hour they were always dead.

In uncleared "bush" there are perhaps 200 or 300 of them to the acre, and at first they are so fearless of man that while clearing is being done they will come up to feed on leaves and shoots as these fall to the ground; but they learn quickly and become active enough in getting away to make shooting them with an air gun or small rifle decidedly better sport than might be supposed. And, provided that they come from places where they are not likely to have had access to garbage, they make excellent food.

Gecarcinus ruricola (?) is seldom more than 2½ inches across and exhibits various shades of purple, crimson and orange, whence its local name of "redshank." It is by far the most numerous of the Cayman crabs, though not often to be found far from the dry sandy land near the sea and very rarely if ever among mangroves. On the whole it is a scavenger rather than a destroyer, and if it were less numerous, would not be more detrimental to plant life than are three or four other species which seldom leave the mangroves. But its numbers are so great that the damage done by its burrowing is appreciable, as is also its destruction of seedlings.

Fortunately it has many enemies, and of these perhaps the chief is *Mus alexandrinus* which, when living in the "bush," seems to feed principally on crabs, though it is no doubt to avoid being itself the food of large ones that it has become almost as arboreal as a squirrel, usually making its nest in some such place as the crown of a cocoanut palm. It shows that this habit of living in trees is a recently acquired one by making for the ground rather than the higher branches when it is hunted.

Among the plants introduced to Grand Cayman by means of seeds picked up on the beach, or found floating, and subsequently grown in a garden *Morinda citrifolia* seems to be fairly established and, as other fruits were found at Cayman Brac 60 miles to the N.E. at about the same time as the original one at Grand Cayman, it seems likely that Cuba was its country of origin ; unless of course all the fruits came from some passing vessel. Fruits of *Mammea americana* are sometimes found in a more or less eatable condition, so this tree also may ultimately be introduced to the island "by sea." The writer has been using seaweed, mostly sargasso, but with some admixture of *Thalassia*, as manure for cocoanut trees—and with excellent result, some of the trees, after about a year's manuring, having increased the number of young nuts in their bunches from 5 or 6 to more than 30, and in two instances to 48 and 49, while the manured trees have so far escaped the diseases which, particularly "bud rot," play such havoc in this island. From this seaweed a large number of seedlings have sprung up and some, including *Terminalia*, *Sesuvium*, and several species of *Ipomoea*, have gone on growing, but generally, if the crabs let them get so far, and it seems all but impossible to protect them from things which climb like cats and burrow like moles, they go off more or less suddenly—presumably when they have come to an end of their original supply of nutriment.

So far nothing has survived which is undoubtedly new to the island, though a *Cassia* and two or three other plants not yet determinable may possibly prove to be so.

It certainly seems that the appearance from sea-borne seed and survival of a new plant on a crab-infested island like this, which only offers suitable soil and surroundings to such seaside plants as it already has in abundance, must be a rare event—without human aid a very rare one indeed.

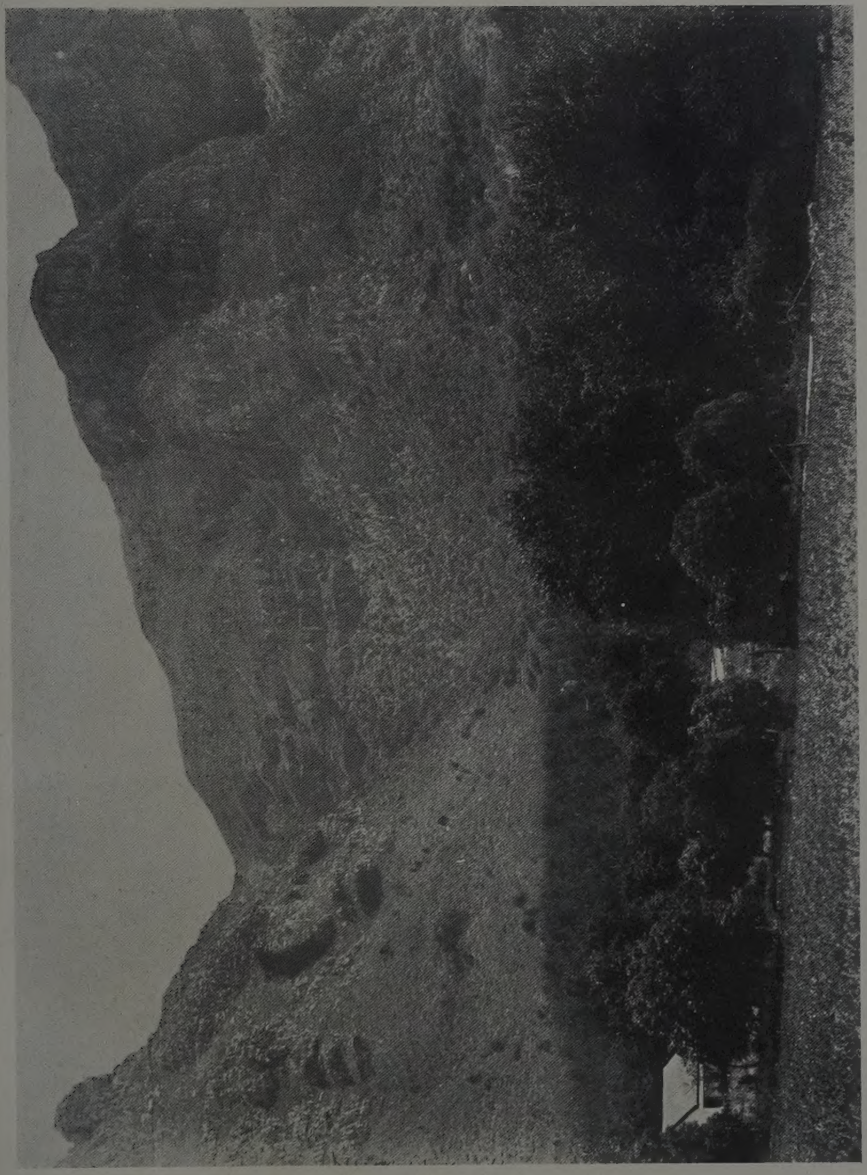

PLATE I. KIRSTENBOSCH, VIEW LOOKING WEST.

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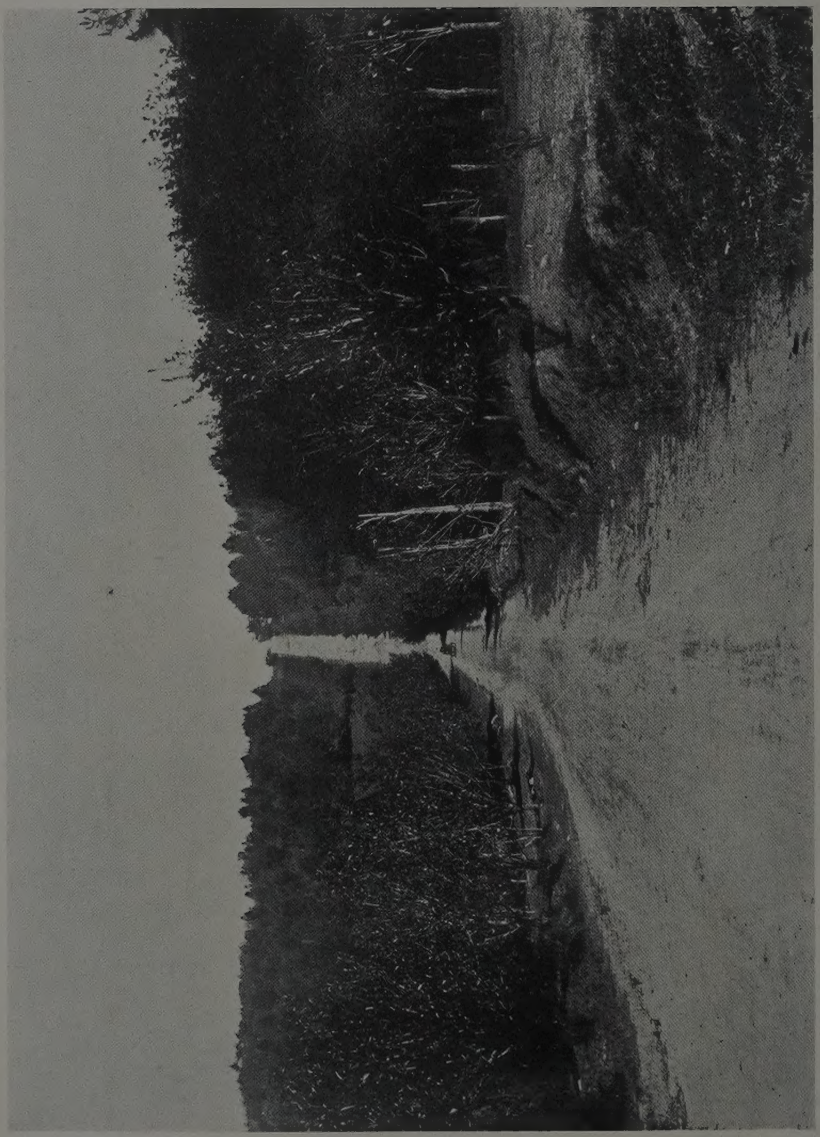

PLATE II. KIRSTENBOSCH, VIEW LOOKING SOUTH.

LIX.—VIEWS IN THE NATIONAL BOTANIC GARDEN OF SOUTH AFRICA.

We have recently received some photographs taken at Kirstenbosch by Professor H. H. W. Pearson, two of which are reproduced on the accompanying plates.

The following particulars were sent with the photographs.

In Plate I. is shown a view looking West taken from within the boundaries of the estate. Two of the best known of the Table Mountain gorges are shown—Window gorge to the extreme right; Skeleton gorge slightly to the left of the centre. Both these deliver perennial streams into the gardens. The upper boundary is not yet known; for purposes of protection it will doubtless be placed on the top of the ridge; in a strict sense the western limit lies at least 700 feet up the slope, and includes the lower ends of the gorges which are richly wooded with native trees. The Curator's house is shown on the left. The trees nearest the foreground are camphors, part of an avenue planted 18 years ago by Mr. Rhodes.

Plate II. represents a view looking due South along the "Rhodes Road." All the area visible lies within the gardens. The Table Mountain range lies out of sight on the right. The Director's house will be built on the summit of the ridge a few yards to the right of the present road. The trees forming the Avenue are *Ficus macropylla* (?) in the foreground; camphors beyond the position of the wagon. The former will probably be removed. The hill slope is covered with *Pinus Pinaster* among which are many Silver trees (*Leucadendron argenteum*). The pines are now being taken out, with a view to covering the ridge of the hill with Silver trees.

A nursery has already been formed, and one of the photographs sent by Professor Pearson shows a bed of the succulent plants recently presented to the gardens, which represent the nucleus of a collection that should be unsurpassed by any other institution. The nursery has been placed on a piece of gently sloping ground with the Curator's office close at hand, and the slope is being terraced to form suitable nursery beds. Over 1000 species of plants have been sent in for cultivation since the commencement of gardening operations on July 1st.

The five Trustees of the Garden have now all been appointed. The names of the three Government nominees and of the representative of the Corporation of Cape Town have been given on p. 311, and the fifth Trustee, the representative of the Botanical Society of South Africa, is Mr. W. Duncan, M.L.A., ex-Mayor of Cape Town.

LX.—THE SOUTH AFRICAN SPECIES OF CLUYTIA.

D. Prain.

While preparing an account of the South African *Crotoneae* for the *Flora Capensis* some difficulty has been experienced in reconciling the history of some of the species, as recounted by Linnaeus, Lamarck, Thunberg, Willdenow and Poiret, with the pre-Linnean figures cited by these authorities. These difficulties have not been experienced by the writer alone; they are reflected in the arrangements adopted by botanists so competent as Drège and Meyer,

Ecklon and Zeyher, Krauss and Baillon, whose work has lain in the field or has been in the main confined to the citation of specimens. These difficulties make themselves apparent even in the pages of careful monographers like Sonder, Müller, Knauf and Pax, all of whom have essayed a critical revision of this genus.

Some comprehension of the various difficulties has only been possible as the result of a close examination of a number of different collections; opportunities for making such an examination as was required have been provided through the kindness of many friends of Kew. In examining the Linnean herbarium the writer has had the benefit of the personal assistance of Dr. Daydon Jackson, thanks to whom it became possible to fix the dates and state the provenance of three extremely critical Tulbaghian specimens, the existence of which, because of inexact knowledge as to these points, has been to some extent instrumental in originating the confusion which marks the work of the earlier writers. To the courtesy of Professor Juel we owe an opportunity of examining the types of Thunberg, to that of Professor Urban we are indebted for the privilege of studying the types of Willdenow, and to that of Professor Lindman for the use of the types of Sonder. In addition the writer has to thank Geheimrat Engler for the loan of specimens from Berlin, Professor Schinz for the use of the material at Zürich, Dr. Lenz for the use of the specimens at Lübeck, and Professors Balfour and Dixon for the use of those at Edinburgh and Dublin respectively. He has also had the privilege of the use of most of the important public and private South African collections—the South African Government Herbarium, the Natal Government Herbarium, the Transvaal Government Herbarium, the Bolus and Albany Museum Herbaria, and those of Dr. Marloth, Mr. Galpin, and the Rev. F. A. Rogers.

It is not necessary to give here an exhaustive account of the contents of every one of these various collections, owing to the fact that the specimens they contain are being cited in detail in a forthcoming volume of the *Flora Capensis*, while the cases of misapplication of names which occasionally mark modern monographs will be dealt with critically under individual species in the subjoined synopsis of the genus. In the case of three collections, however, a more detailed review of their specimens is required, in order that the position created by their owners may be appreciated. These collections are those which belonged to Linnaeus, to Thunberg, and to Willdenow respectively, upon an appreciation or misappreciation of which has depended all the advances and most of the confusion of the period from 1753, when Linnaeus published the first edition of the *Species Plantarum*, to 1810, when Poiret published the second volume of the *Supplement* to the *Encyclopaedia*.

Linnaeus. The bi-nominal contributions of Linnaeus to the elucidation of the genus *Cluytia*—spelt by him *Clutia*, began with the first edition of the *Species Plantarum* in 1753, wherein (p. 1042) he enumerated five species. Three of these do not come from South Africa and do not belong to the genus; they therefore do not concern us. The remaining two are *C. Alaternoides* and *C. pulchella*. To these Linnaeus added, in the second edition of the *Species Plantarum* in 1763, a third species *C. polygonoides* (p. 1475), and in

the second *Mantissa* in 1771 a fourth species *C. tomentosa*. So far as the three species of 1753 and 1763 are concerned we know, from the fact that the *Species Plantarum* was in the main a bibliographical compilation, that any specimens in the Linnean herbarium bearing the corresponding names must be taken rather as representative examples than as types in the modern sense of that term. It is only in the case of the fourth species that the Linnean herbarium contains the actual specimen upon which the specific description was based. Even in this case, as we shall see, Linnaeus in effect ultimately treated that specimen as a representative and not as a typical one. Dealing with these species in detail we find that :—

(1.) **Alaternoides**, Sp. Pl. 1042 (sphalm. *alaternoides*) includes, according to the cited figures, three very distinct S. African plants,

(*a*) Burmann's *Chamaelea foliis oblongis nervosis floribus ex foliorum alis* of 1738 (Rar. Afr. 116, t. 43, fig. 1) ;

(*b*) Burmann's *Chamaelea foliis latis oblongis floribus ex alis in spicam erectis*, also of 1738 (l.c. 118, t. 43, fig. 3) ; and

(*c*) Commelin's *Alaternoides africana telephii legitimi imperati folio* of 1701 (Hort. Amst. ii. 3, t. 2) :

(2.) **pulchella**, Sp. Pl. 1042, was based upon the plant figured by Commelin in 1697 as *Frutex aethiopicus portulaceae folio, flore ex albo virescente* (l.c. i. 177, t. 91) :

(3.) **polygonoides**, Sp. Pl. ed. 2, 1475, was created in order to accommodate the second of the three distinct species to which the name *Alaternoides* had been applied ; though, by an oversight, Linnaeus, while making Burmann's second figure the basis of his new species, also left the synonym where it had been placed by him in 1753 : while

(4.) **tomentosa**, Mant. ii. 299, was based on a specimen collected by Governor Tulbagh (*Tulbagh* 129) and despatched by him to Linnaeus on April 25, 1763—too late therefore to find a place in the second edition of the *Species Plantarum*.

When we turn to the material of the genus *Cluytia* in the Linnean herbarium which illustrates the foregoing arrangement, we find that there are fifteen sheets in the '*Clutia*' cover. Three of these represent species of Linnaeus' *Clutia* which do not belong to the genus as now understood, and so do not here further concern us. Of the remaining twelve sheets one bears two distinct plants so that in all there are thirteen specimens. In two instances two sheets have been pinned together by Linnaeus himself, only one sheet of the pair having been written up by him. Taking the species in the order in which they were treated by Linnaeus in his published works we find that these thirteen specimens on their twelve sheets arrange themselves as follows :—

(1.) **Alaternoides** : a sheet written up by Linnaeus as "1. alaternoides," which, as we know from Jackson (Ind. Linn. Herb. 59), was already in his possession in 1753. Whence Linnaeus obtained this specimen is not indicated ; the plant itself is one described and figured by Burmann in 1738 (Rar. Afr. 116, t. 43, fig. 1). This is the only specimen of *C. Alaternoides* possessed by Linnaeus in 1753. There are, however, two other sheets in the Linnean

collection now which bear the name "alaternoides." One of these is a sheet on which are fixed two very different specimens ; these specimens bear the numbers 115 and 127 ; they were collected by Governor Tulbagh and sent by him to Linnaeus on 25 April, 1763. The sheet in question has been written up by Linnaeus himself, and an examination of Tulbagh's invoice list shows that upon it also Linnaeus has, against these two numbers, placed the endorsement *Clutia alaternoides*. The two plants not only differ from each other ; both of them differ from the first of the three different plants referred by Linnaeus, on purely bibliographical grounds, to *C. Alaternoides* ; neither of them belong to the second or to the third of the three plants whose portraits have been cited by Linnaeus under *C. Alaternoides*. The third and last sheet in the Linnean herbarium which has been written up as *C. Alaternoides* is one which reached Linnaeus from Thunberg. The specimen it bears is the plant figured by Commelin as *Alaternoides africana, etc.*, but the name "alaternoides" on this sheet was written up, not by Linnaeus, but by his son.

(2.) **pulchella** : a sheet written up by Linnaeus as "2. alaternoides," which we again know from Jackson (l.c.) to have been already in Linnaeus' collection in 1753. As regards this plant there is not the element of doubt which attaches to *C. Alaternoides*, so far as concerns the conception which Linnaeus may possibly have formed of the limitation of the species ; the specimen which he has himself written up belongs to the species figured by Commelin as *Frutex aethiopicus portulaceae folio, etc.* But if he has not in this instance created confusion as to identity, Linnaeus has shown that he entertained a somewhat indefinite conception as to the distribution of the species. This is one of the two instances where Linnaeus has pinned two sheets together ; the undermost sheet, on which the specific name has not been written, bears in Linnaeus' hand-writing the word "India."

(3.) **polygonoides**: two sheets pinned together by Linnaeus. The two specimens are conspecific, though only the uppermost has been written up by Linnaeus ; on one of the sheets is an indication that the specimen was collected by Sparrmann. The two specimens belong to a plant described and figured by Burmann in 1738 (Rar. Afr. 118, t. 43, fig. 3). There is no indication as to the date at which Linnaeus acquired either specimen, but it seems clear that at least one of them had reached him before 1763 ; it is difficult otherwise to account for the transfer of this plant from *C. Alaternoides*, in which it had been placed in 1753, and for its treatment as a distinct species. This transfer, however, and this recognition of what is clearly a valid species, was marred by more than the oversight which the citation of Burmann's name under two species involves. We find from his herbarium that though Linnaeus, as soon as he had an actual specimen before him, realised that Burmann had not committed the error of figuring one species under two different names, he had nevertheless formed the same imperfect conception of the limitation of Burmann's second species that he had of Burmann's first one. This plant, represented by the two specimens whose sheets are pinned together, has polished leaves with revolute margins borne on perfectly glabrous twigs. But, on

another sheet in his herbarium which bears a specimen with similarly polished leaves, Linnaeus has again written the name "polygonoides," though in this instance the leaves of the plant have involute margins and are attached to twigs which are puberulous.

(4.) **tomentosa**: a sheet bearing the specimen marked 129, already referred to as having been collected by Governor Tulbagh. Here, it might have been conceived, the creation of misapprehension was hardly possible. Yet, even in this case, the confusion imported into the conception of *C. polygonoides* was repeated. Thunberg, we find, gave specimens of two species of *Clutia* to Linnaeus; one of these, which Linnaeus did not attempt to determine, was referred to *C. Alaternoides* by the younger Linnaeus; the other, with which Linnaeus did deal, he wrote up as "Clutia tomentosa, Mant., femina, CBS." This endorsement indicates the belief of Linnaeus that what Thunberg had given him was the female of his own *C. tomentosa*, originally described in the second *Mantissa* from Tulbagh's male specimen. The capsules of Thunberg's plant are quite glabrous; those of *C. tomentosa*, Linn., are densely pubescent, so that the identification was inexact.

We have now accounted for eleven of the thirteen specimens in the "Clutia" cover of the Linnean herbarium and seen that eight of these have been actually named by Linnaeus, while two more have received at his hands the 'identification by implication' which the pinning together of two sheets necessarily suggests; the eleventh, as we have explained, was written up by the younger Linnaeus—not without justification, seeing that the plant actually belongs to one of the three species included by Linnaeus under *Alaternoides*, the name which the younger Linnaeus wrote upon the sheet. The two remaining specimens have been given no specific name either by Linnaeus or by his son. On one of them, which was collected by Sparrmann and which is conspecific with the Thunbergian specimen to which the younger Linnaeus gave the name *C. Alaternoides*, Linnaeus himself has written "Clutia" only. On the other, as to the history of which we find no clue in the Linnean herbarium, nothing has been written either by Linnaeus or by his son. The interest of this latter specimen is (*a*) that it represents a species quite distinct from any of the species rightly or wrongly identified by Linnaeus: and (*b*) that it is conspecific with a specimen, obtained from Sonnerat, which was treated by Lamarck in 1786 (Encyc. Meth. ii. 54) as the basis of his species *C. daphnoides*.

Before leaving these specimens of the four South African species of Linnaeus, it may be of use to indicate the most appropriate incidence of the various Linnean names. In doing this it is more convenient to consider them in reversed chronological sequence. As has already been indicated, the last species to be published, *C. tomentosa*, Linn. (Mant. ii. 299), is the only one as to which it is definitely known (*a*) that the description was based upon a particular specimen, and (*b*) that this specimen is still available for study. The specimen is "Tulbagh 129 in Hb. Linn.," which belongs to *C. tomentosa* as understood by Lamarck in 1786, and not to *C. tomentosa* as understood, in the light of Linnaeus' later and erroneous identification,

by Thunberg in 1794. We have in reality hardly more difficulty when deciding as to the name *C. polygonoides*, Linn. (Sp. Pl. ed. 2, 1475), for of the two plants included by Linnaeus in the species, it is the one with revolute leaf-margins which alone agrees with the figure by Burmann that Linnaeus cites. As regards *C. pulchella*, Linn. (Sp. Pl. 1042), no difficulty as regards identification arises, and the provenance "India" erroneously attributed to one of the two specimens, is doubtless the result of the receipt, from some correspondent, of specimens collected partly in South Eastern Asia, partly in South Africa, where the recollection of the donor as to the locality of some of his specimens had become obscured. The only serious difficulty is that connected with *C. Alaternoides*, Linn. (Sp. Pl. 1042). Here, as we have seen, Linnaeus at the outset included three very different plants, though at the time of his first publication of the species he only had a specimen of that which we have indicated as *C. Alaternoides*, a (Burm. Rar. Afr. 116, t. 43, fig. 1).

As regards the one which we have indicated as *C. Alaternoides*, b (Burm. l.c. 118, t. 43, fig. 3), we have seen that, as soon as he had at his disposal an actual specimen, Linneaus removed the plant from *C. alaternoides* and made it the basis of a new species. As regards the plant which we have indicated as *C. Alaternoides*, c (Comm. Hort. Amst. ii. 3, t. 2), we cannot, it is true, say that on obtaining actual specimens, Linnaeus removed the plant from *C. Alaternoides*; we can, however, say that though he did obtain two specimens of Commelin's species—one from Sparrmann and one from Thunberg—it did not occur to him to add the plant, when he actually had it before him, to his *C. Alaternoides*. His son, it is true, did recognise the identity of Thunberg's specimen with the plant figured by Commelin, and in spite of the striking difference between Thunberg's plant and the one to which his father's original specimen of *C. Alaternoides* belongs, named it also *C. alaternoides*. In this the younger Linnaeus has been followed, so far at least as citation is concerned, by most subsequent authors; but as to actual specimens we find that careful workers either, like Baillon (Étud. gén. Euphorb. Atl. 30 and Adansonia, iii. 152), recognise the validity of its claim to specific rank; or, like Sonder (Linnaea, xxiii. 127) and Müller (DC. Prodr. xv. 2, 1047) and Pax (Engl. Pflanzenr.-Euphorb. Cluyt. 68), treat it as a distinct and outstanding variety of *C. Alaternoides*. So far then as the three plants originally included in the species by Linnaeus himself are concerned, we are under the necessity of limiting his name *C. Alaternoides* to that which comes first in order of citation, and is, at the same time, the only one whereof, at the time of publication of the species, Linnaeus possessed a specimen.* So far as the two plants (Tulbagh n. 115 and n. 127) which Linnaeus subsequently confused with each other and with *C. Alaternoides*, are concerned, their exclusion from *C. Alaternoides* is essential, and calls for no further discussion, in spite of the fact that it is upon one of these two, which Linnaeus had not seen when he first published the species, that Müller has based his variety "genuina." The only

* This specimen is, moreover, conspecific with the Cliffortian plant referred by Linnaeus to *C. Alaternoides*.

difficulty associated with the action which the facts of the case impose upon us is that we are compelled to exclude from *C. Alaternoides* the particular species from which Linnaeus borrowed an old generic name in order to employ it as a specific epithet. In connection with this, it is to be remarked that, owing to an uncorrected typographical error on the part of Linnaeus, the real significance of the specific term has been overlooked in most of the works dealing with the genus except Persoon's *Synopsis* and the *Hortus Kewensis*.

In the first edition of the *Hortus Kewensis* (1789), the name *C. Alaternoides* was used (vol. iii, 419) for a plant which had been in cultivation in England for nearly a century—almost certainly that figured by Burmann (Rar. Afr. 116, p. 43, fig. 1). Here, for the first time, Dryander, on Banks' behalf and in Aiton's name, proposed the orthography *Cluytia*, now adopted in place of *Clutia*.

Thunberg in 1794 enumerated the South African species of *Cluytia* known to him (Prodr. Pl. Cap. 53); these species were more fully described in 1823 in Thunberg's *Flora Capensis* as edited by Schultes. An impression prevails that the names used in the *Prodromus* do not always have the same incidence in the *Flora*. An examination of the actual specimens in the herbarium of Thunberg shows that this suspicion, so far as the genus *Cluytia* is concerned, is only justified in the case of *C. tomentosa*, Thunb., not of Linn.; even then, it is justified only in a very qualified manner.

In addition to the four species recognised by Linnaeus, Thunberg in his *Prodromus* recognised five others. Two of these, *C. acuminata* and *C. hirta*, do not belong to the genus; the other three, *C. ericoides*, *C. pubescens* and *C. heterophylla*, do. Besides these there is in Thunberg's herbarium another specimen, which is not accounted for in his writings. This he has named tentatively *C. retusa*; it is, however, quite different from *C. retusa*, Linn., because it really is a *Cluytia*, which the true *C. retusa* of Linnaeus is not. The species known to or recognised by Thunberg are :—

(1.) **C. Alaternoides**, represented by five specimens, whereof three belong to *C. africana*, Poir., which as regards bibliographical reference, Linnaeus included in *C. Alaternoides* and Lamarck in *C. daphnoides*, but which as regards specimens neither author dealt with; of the remaining specimens, one is the same as Tulbagh, 127, and is therefore *C. rubricaulis* var. *grandifolia*, while the other is *C. Alaternoides* var. *brevifolia*, a form unknown to Linnaeus. It is therefore to be noted that although *C. Alaternoides*, Thunb., is intended to be Commelin's plant, it really includes three distinct forms, none of which can be identified with *C. Alaternoides*, Linn.

(2.) **C. pulchella**, represented by two sheets, a male and a female, both of which are *C. pulchella*, Linn.

(3.) **C. polygonoides**, represented in herb. Thunb. by two specimens, a male and a female, both of which belong to the species figured by Burmann (Rar. Afr. 116, t. 42, fig. 3) and therefore to *C. polygonoides*, Linn.

(4.) **C. tomentosa**, represented by two sheets, a male and a female, neither of which is *C. tomentosa*, Linn. The responsibility for this identification does not, however, rest with Thunberg but with Linnaeus, for the female specimen is a manifest duplicate of the sheet in the Linnean herbarium which Linnaeus erroneously wrote

up as *C. tomentosa*, Mant. *femina*; for this reason it is desirable to treat the female specimen as the basis of *C. tomentosa*, Thunb. (Prodr. Fl. Cap. 53). The male specimen of *C. tomentosa*, Thunb., not of Linn., is certainly identical with what was described by Lamarck as *C. daphnoides*, the female is, on the other hand, much more like the distinct plant collected by Drège, which was issued by E. Meyer in 1843, also as *C. tomentosa*, but which Sonder in 1850 treated as a distinct species. Sonder indeed believed the female of *C. tomentosa*, Thunb., to be identical with *C. tomentosa*, E. Mey., and, in consequence, named the species *C. Thunbergii*. Müller, while agreeing with Sonder that *C. Thunbergii* is distinct, at least as a variety, excluded therefrom Thunberg's female plant and treated it as identical with the male part of *C. tomentosa*, Thunb. non Linn.; the description of *C. tomentosa*, Thunb., in Schultes' edition of the *Flora Capensis* shows that in 1823 both plants were included in the species by Schultes. As to this conclusion Müller, whom Pax has followed, is hardly justified: perhaps the same thing may be said of the treatment by Sonder, whom the writer has followed in this paper. A better view than either might be to consider *C. tomentosa*, Thunb., female, as intermediate between *C. daphnoides*, Lamk., and *C. Thunbergii*, Sond. ex Pax.

(5.) **C. ericoides**, Thunb., is a good species which Linnaeus was unable to distinguish from *C. polygonoides*; it is represented in Thunberg's herbarium by a single male specimen.

(6.) **C. pubescens**, Thunb., is another good species, and

(7.) **C. heterophylla**, Thunb., is yet another good species, neither of which was known to Linnaeus.

In addition to the specimens representing these seven species there is the specimen, already alluded to, not taken up in the *Prodromus* or in the *Flora*, which Thunberg has written up as *Clutia retusa*? It is not *C. retusa*, Linn., because it really is a *Cluytia*; it belongs to the distinct species published by Sonder in 1850 as *C. affinis*.

Jacquin in 1797 (Hort. Schönbrunn. ii., 67, t. 250) described and figured from a plant grown at Vienna a very distinct species, *C. polifolia*, which was not known either to Linnaeus or to Thunberg.

Willdenow, some time between 1797 and 1805, published figures of *C. Alaternoides*, *C. polygonoides* and *C. daphnoides* (Hort. Berol. tt. 50, 51, 52). The date assigned by Pax to this work is 1816, which is only the date of its title page and its completion; Willdenow himself cited these plates in 1805 (Sp. Pl. iv. pars. 2). Of these three figures the first may be accepted as representing a form of *C. Alaternoides*, Linn. But the second is not, nor is it even nearly allied to, *C. polygonoides* as understood by Linnaeus, Burmann and Thunberg. The last is *C. daphnoides* as described by Lamarck; it is one of *Multiglandulosae*, and therefore cannot be the plant figured by Commelin which both Lamarck and Willdenow have included in their *C. daphnoides*.

The identity of the various species enumerated by Willdenow in 1805 (Sp. Pl. iv. pars. 2) is best arrived at by enumerating the specimens in his herbarium under the various species.

(1.) **C. alaternoides**, Hb. Willd. 18592, includes four specimens the first of which is not *C. alaternoides* at all, but is *C. pterogona*, Müll. Arg.; the second is really *C. alaternoides*, Linn.; the third is a form of *C. rubricaulis* Eckl.; the last is, at least in part, *C. africana*, Poir.

(2.) **C. pulchella**, Hb. Willd. 18601, includes two specimens both of which belong to *C. pulchella*, Linn.

(3.) **C. polygonoides**, Hb. Willd. 18593, includes two specimens which Müller has treated (DC. Prodr. xv. 2, 1048) as being somewhat different but which are in fact identical. The species they represent is not *C. polygonoides*, Linn., but a distinct plant, *C. rubricaulis* var. *grandifolia*.

(4.) **C. tomentosa**, Hb. Willd. 18600, is represented by a solitary specimen which belongs to the original *C. tomentosa*, Linn., described, from male material only, in the second *Mantissa*.

(5.) **C. ericoides**, Hb. Willd. 18597, is represented by a single specimen which is really *C. ericoides*, Thunb.

(6.) **C. pubescens**, Hb. Willd. 18599, has nothing to do with the true *C. pubescens*, Thunb., but is the female portion of *C. tomentosa*, Thunb. non Linn.

(7.) **C. daphnoides**, Hb. Willd. 18594, is the plant described by Lamarck under this name.

(8.) **C. heterophylla**, taken up by Willdenow from Thunberg is not represented in Hb. Willd.

(9.) **C. polifolia**, taken up by Willdenow from Jacquin is not represented in Hb. Willd.

(10.) **C. tenuifolia**, Hb. Willd. 18598, is a plant first described by Willdenow as a new species which, however, it is not possible to separate from *C. ericoides* as more than a variety.

Besides these there is a species, *C. patula*, Hb. Willd. 18602, accounted for in the *Sp. Pl.*, which is represented by three specimens but which we must exclude because one of the specimens is not Euphorbiaceous and the other two are examples of *Blachia umbellata*. In the Willdenow herbarium there are in addition two species which for some reason Willdenow did not venture to include in the *Species Plantarum*. It is almost regrettable that he did not because, though they are probably only varieties of one species they are very distinct varieties, while the species to which they belong is a very distinct species. One of the two, Hb. Willd. 18596, is represented by one specimen which Willdenow had defined as *C. thymifolia, foliis lineari-lanceolatis pendulis solitariis elongatis*; the other, Hb. Willd. 18595, also represented by one specimen, he had defined as *C. gnidioides, foliis oblongo-obovatis acutis pedunculis axillaribus unifloris*. The first was subsequently characterised as *C. tenuifolia* by Sonder, under the mistaken belief that he was dealing with *C. tenuifolia*, Willd.; it really is *C. rubricaulis* var. *tenuifolia*. The second is *C. rubricaulis* var. *microphylla*.

Poiret in 1810 (Encyc. Meth. Suppl. ii. 302) advanced our knowledge of *Cluytia* by recognising as *C. africana* the plant which both Lamarck and Willdenow had confused with *C. daphnoides*, though he in turn introduced another confusion by arriving at the unwarranted conclusion that *C. daphnoides* as figured by Willdenow is different from *C. daphnoides* as described by Lamarck.

The second edition of the *Hortus Kewensis* (1813) is a *résumé* of previous work which overlooks the emendation of Poiret, accepts the erroneous conception of *C. polygonoides* first introduced by Willdenow, and adds to our knowledge of the genus only some acquaintance with those species introduced to English gardens.

After the appearance of the account in the *Hortus Kewensis* (ed. 2, v. 422) there was little reference for a generation to these South African species of *Cluytia*. In 1843 E. Meyer (Zwei Pfl. Documente, 174) issued a list of determinations of specimens collected by Drège; in 1845 Krauss (Flora, xxviii. 81, 82) issued identifications of specimens collected by himself; in 1850 Sonder (Linnaea, xxiii. 121 *et seq.*) gave a *résumé* of the South African species; in 1862 Baillon (Adansonia, iii. 151 *et seq.*) issued a revised list of Sonder's determinations; in 1866 Müller (DC. Prodr. xv. 2, 1043) monographed the genus. It is not here necessary to pass under review all the specimens dealt with by these writers or to discuss their efforts to disentangle the confusion created more particularly by Linnaeus. Their results and those of Professor Pax, the most recent monographer of the genus whose work has been of the greatest assistance in dealing with the South African species, may be readily followed with the assistance of the synonymy cited in the subjoined systematic synopsis.

Included in this synopsis are descriptions of those species for which a description is still required; preceding it is printed a key to the whole of these South African forms.

Cluytia, Linn. emend. Dryand.

Clutia *Linn. Sp. Pl.* ed. 1, 1042 (1753). Altora, *Adans. Fam.* ii. 356 (1763). Cluytia, *Dryand. in Ait. Hort. Kew.* iii. 419 (1789). Cratochwilia, *Neck. Elem.* ii. 339 (1790). Clytia, *Stokes, Bot. Mat. Med.* iv. 543 (1812).

*Petala maris singula 1–2-glandulosa; glandulae saepissime petalorum ungui adnatae raro a petalo liberae et in fundo calycis sitae.

†Folia sessilia vel subsessilia, opaca vel rarissime (*pterogona*, *impedita*) pellucido-punctata.

‡Folia margine involuta, glabra, ericoidea; ovarium glabrum.

Ramuli puberuli; folia 3–4-plo longiora quam lata
1. *C. ericoides.*

Ramuli glabri; folia minopere longiora quam lata
2. *C. nana.*

‡‡Folia margine nunc plana nunc revoluta; nunquam ericoidea.

§Folia pubescentia; ovarium tomentosum.

Petala feminei modo maris basi glandulosa.

Folia parvula, quam lata vix longiora 3. *C. tomentosa.*

Folia mediocria, quam lata duplo longiora
4. *C. marginata.*

Petala feminei eglandulosa.

Folia margine plana ... ... 5. *C. sericea.*

Folia margine plus minusve revoluta.

Folia 2·5–7·5 cm. longa, minopere revoluta
6. *C. Katharinae.*

Folia 1·2–2·5 cm. longa, saepius valde revoluta
7. *C. pubescens.*

§Folia glabra ; ovarium glabrum.
Caules ramulique alati ; alae membranaceae, erosodenticulatae ; folia pellucido-punctata
8. *C. pterogona.*
Caules ramulique cylindrici vel angulati angulis coriaceis integerrimis.
Folia opaca.
Folia margine laevia vel minutissime scabrida.
Folia margine valde revoluta.
Folia 8–15 mm. longa ... 9. *C. polifolia.*
Folia 4–6 mm. longa ... 10. *C. brevifolia.*
Folia margine plana vel subplana..
Caules simplices vel subsimplices e basi lignoso plures ... ... 11. *C. virgata.*
Caules copiose ramosi ... 12. *C. laxa.*
Folia margine distincte subdenticulatim scabrida.
Folia margine plus minusve revoluta.
Folia majuscula, 1·5–4 cm. longa.
Folia obovato-oblonga, 12–16 mm. lata
13. *C. africana.*
Folia lanceolata vel obovato-lanceolata, 4–5 mm. lata ... 14. *C. Alaternoides.*
Folia perparva, obovato-oblonga, 5 mm. longa, 2 mm. lata ... 15. *C. imbricata.*
Folia margine plana.
Internodia quam folia imbricata breviora
16. *C. rubricaulis.*
Internodia foliis discretis subaequilonga
17. *C. ovalis.*
Folia pellucido-punctata, margine plana
18. *C. impedita.*
††Folia distincte petiolata ; ovarium glabrum.
Folia margine plus minusve revoluta ; caules prostrati
19. *C. alpina.*
Folia margine plana ; caules erecti.
Folia pellucido-punctata.
Capsula glabra ; ramuli foliique glabri
20. *C. glabrescens.*
Capsula verrucoso-punctata.
Ramuli foliique primum pubescentes, demum glabri.
Petioli 6 mm. longi vel breviores ; ramuli foliique laeves ... ... 21. *C. Galpini.*
Petioli 8 mm. longi vel longiores ; ramuli foliique nunc verrucosi nunc laeves 22. *C. pulchella.*
Ramuli foliique subtus persistenter velutini
23. *C. mollis.*
Folia haud pellucido-punctata, plus minusve pubescentia
24. *C. affinis.*
**Petala maris singula 3–10-glandulosa ; glandulae rarissime petalorum ungui adnatae, fere semper e fundo calycis ortae.
†Folia pellucido-punctata.
Folia margine plana ; caules manifeste ramosi ; ovarium glabrum ... ... 25. *C. natalensis.*

Folia margine parum revoluta.
Caules manifeste ramosi.
Ovarium glabrum.
Folia apice obtusa ... ... 26. *C. platyphylla.*
Folia apice acuta vel breviter acuminata 27. *C. Dregeana.*
Ovarium pubescens ... ... 28. *C. hirsuta.*
Caules simplices vel parcissime ramosi e basi lignoso plures.
Pedicelli fructigeri quam capsula 3–4-plo longiores; foliorum nervi subtus haud elevati; ovarium saepius plus minusve hirsutum ... 29. *C. disceptata.*
Pedicelli fructigeri quam capsula vix vel haud longiores; ovarium semper glabrum.
Foliorum nervi subtus haud elevati.
Folia basi cuneata vel rotundata 30. *C. monticola.*
Folia basi omnia subcordata ... 31. *C. cordata.*
Foliorum nervi subtus manifeste reticulatim elevati; folia superiora basi cuneata, inferiora basi subcordata ... . 32. *C. heterophylla.*

††Folia haud pellucido-punctata; ovarium glabrum.
Folia hebetia, margine plana.
Folia distincte petiolata, 4–5-plo longiora quam lata; ramuli subargute angulati ... 33. *C. daphnoides.*
Folia sessilia vel subsessilia, vix 2-plo longiora quam lata; ramuli cylindracei.
Caules prostrati; ramuli pubescentes; folia pilis perpaucis secus costam supra ornata, ceterum glabra ... ... 34. *C. vaccinioides.*
Caules erecti.
Ramuli foliisque pubescentes ... 35. *C. Thunbergii.*
Ramuli foliisque glaberrimi ... 36. *C. crassifolia.*
Folia nitentia, margine revoluta; planta omnino glabra 37. *C. polygonoides.*

§ I. Pauciglandulosae, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 53 (1911), *ampl.*—Petala maris singula 1–2-glandulosa; glandulae saepissime petalorum ungui adnatae raro a petalo liberae et in fundo calycis sitae.

¶ 1. Involutae, *Pax et K. Hoffm.* l.c. 81 (1911).—Folia ericoidea, coriacea, glabra, nitentia, subtus convexa, supra concava, margine involuta.—Species 2; *C. ericoides, C. nana.*

1. **Cluytia ericoides**, *Thunb. Prodr. Pl. Cap.* 53 [Clutia] (1794); *Willd. Sp. Pl.* iv. 2, 880 (1805); *Pers. Synops.* ii. 636 (1807); *Poir. Encyc. Meth. Suppl.* ii. 303 (1810); *Thunb. Fl. Cap. ed. Schult.* 270 (1823); *Spreng. Syst.* iii. 48 (1826); *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *partim* (1843); *Sond. in Linnaea*, xxiii. 121, *partim* (1850); *Dietr. Synops.* v. 455 (1852); *Baill. Adansonia*, iii. 151, *partim* (1862); *Müll. Arg. in DC. Prodr.* xv. 2, 1055, *partim et cit. Bot. Reg. excl.* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 81, *partim et quoad* fig. 19 II. J. *tantum sed. excl. cit. Bot. Reg.* (1911). C. ericoides, *var.* minor, *Krauss in Flora*, xxviii. 82 (1845).

Coast Region: Piquetberg, Malmesbury, Worcester, Cape, Stellenbosch, Caledon, Riversdale, George, Knysna, Uitenhage, Port Elizabeth, and Albany Divs.

Central Region: Prince Albert Div. (fide Sonder).

Var. β, **pachyphylla**, *Prain*; suffrutex, 3–6 dm. altus; ramuli robusti, simplices vel iterum parce stricte ramosi, puberuli; folia auguste ovato-lanceolata, acuta vel acuminata, basi late cuneata, 1·2–1·8 cm. longa, 3–4 mm. lata, subtus plus minusve convexa, supra saepissime concava sed nonnunquam (*C. ambigua*) ibi margine manifeste involuto excepto plana. C. ericoides, *E. Mey.* l.c., *partim* (1843); *Sond.* l.c., *partim* (1850); *Baill.* l.c., *partim* (1862); *Müll. Arg.* l.c., *partim* (1866); *Pax* l.c., *partim et quoad* fig. 26 A–E *tantum* (1911); *vix Thunb.* C. ambigua, *Pax et K. Hoffm.* l.c. (1911). C. pachyphylla, *Spreng. MSS. in sched. Zeyh.*

Coast Region: Cape, Stellenbosch, and Uitenhage Divs.

var. γ, **tenuis**, *Sond.* l.c. 122 (1850); suffrutex, 3–6 dm. altus; ramuli gracillimi, saepissime iterum copiose sed fastigiatim ramosi, puberuli; folia linearia, 1·2–1·8 cm. longa, 1–1·5 mm. lata, subtus semper convexa, supra saepissime concava sed raro ibi margine manifeste involuto excepto plana. *Baill.* l.c. 151 (1862). C. tenuifolia, *Willd.* l.c. (1805); *Pers.* l.c. (1807); *Poir.* l.c. 302 (1810); *Spreng.* l.c. 49 (1826); *Dietr.* l.c. (1852); *Baill.* l.c. 152 (1862); *Müll. Arg.* l.c. (1866); *Pax* l.c. (1911). C. ericoides, *Ait. Hort. Kew.* ed. 2, v. 423 (1813); *Edw. Bot. Reg.* t. 779, *excl. syn. Thunb. et syn. Willd.* (1824); *Sond.* l.c., *partim et quoad loc.* Knoblauch *tantum* (1850); *Müll Arg.* l.c., *quoad cit. Bot. Reg.* (1866); *nec Thunb.* C. gracilis, *Baill.* l.c. 151 (1862).

Coast Region: Caledon, Swellendam and Riversdale Divs.

The central variety, β *pachyphylla*, of the three varieties of this species, is that from which diverge in opposite directions and in almost equal degree the original *C. ericoides* as defined by Thunberg, and *C. tenuifolia* as described by Willdenow. When a comparison is instituted between these two extreme varieties the action of Müller and Pax in maintaining Willdenow's species is readily appreciated. But when full allowance is made for the range of variation that is met with in this group of forms the action of Sonder impresses the student as being more natural than that of Willdenow and Müller. In adopting a name for what is the fundamental, though not in this case the typical, variety it has been unfortunately necessary to avoid using the epithet *ambigua* employed in a specific sense by Pax and K. Hoffmann, owing to these authors having restricted their name to that particular condition of β *pachyphylla* in which the leaves are very nearly flat, at least on the upper surface. For some reason which is not clear, both Müller and Pax refer to the typical variety the plant figured as *C. ericoides* by Edwards in the *Botanical Register*. An examination of the old cultivated specimens in the Kew herbarium and a glance at Edwards' plate show that the figure really represents the plant described by Willdenow as *C. tenuifolia*, not that described by Thunberg as *C. ericoides*. This, too, is the plant enumerated in Aiton's *Hortus Kewensis* as *C. ericoides*, which had been introduced to English horticulture by F. Masson in

1790. There is not the slightest evidence that either Thunberg's or Sprengel's plant ever came into cultivation in Europe. It may be remarked, in connection with this question, that the specimen in herb. Willdenow (n. 18598) upon which Willdenow based his description of *C. tenuifolia* is a cultivated one, and that Willdenow notes it as having been grown in a garden in England. Krauss, who in the case of most of the South African Cluytias known to him came to well considered conclusions, went very nearly as far astray as did Linnaeus; if the latter included *C. ericoides* in his *C. polygonoides*, the former included *C. polygonoides* in his *C. ericoides*. But Krauss treated the two as distinct varieties; *C. ericoides*, Krauss, is *C. polygonoides*, Linn., and *C. ericoides* var. *minor*, Krauss, is *C. ericoides*, Thunb.

2. **Cluytia nana**, *Prain*; suffrutex nanus, 7–10 cm. altus; ramuli crassiores, iterum intricatim ramosi, glaberrimi; folia sessilia, coriacea, ovata, acuta, basi rotundata, margine involuta, adpresse imbricata, 3 mm. longa, 2 mm. lata, subtus convexa subcarinata, supra altius concava, glaberrima; flores dioici; masculi solitarii, feminei nondum visi; pedicelli perbreves, glaberrimi; sepala maris ovata, cucullata, obtusa, squama basali 4-loba aucta; petala ovata, obtusa, unguiculata, glandula minima basi laminae apice unguis induta; ovarii rudimentum brevissimum, subglobosum, glabrum.

Kalahari Region: Orange River Colony; Mont aux Sources, 3000 m., *G. Mann in herb. Marloth*, 2870.

This very striking plant comes nearest to typical *C. ericoides*, Thunb., but, in addition to having a different habit and distinctive facies, both perhaps explicable by the considerable altitude at which it occurs, it is readily separated from all three varieties of that species on account of its perfectly glabrous young twigs.

¶2. **Tomentosae**, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 75 (1911) *emend. et* C. Thunbergii *excl.*—Folia haud ericoidea, firme membranacea vel papyracea, tomentosa vel sericea, hebetia, margine plana vel raro (*C. Katharinae*) parum revoluta; petala feminei modo maris basi glandulosa; ovarium dense tomentosum; capsula tomentosa.—Species 4; *C. tomentosa*, *C. marginata*, *C. sericea*, *C. Katharinae*.

3. **Cluytia tomentosa**, *Linn. Mant.* ii. 299 [Clutia] (1771); *Lamk Encyc. Meth.* ii. 54 (1786); *Willd. Sp. Pl.* iv. 881, *excl. syn. Thunb.* (1805); *Pers. Synops.* ii. 636 (1807); *Spreng. Syst.* iii. 49 (1826); *Sond. in Linnaea*, xxiii. 131 (1850); *Dietr. Synops.* v. 455 (1852); *Baill. Étud. gén. Euphorb.* 31, t. 16, f. 20, 21 (1858) et *Adansonia*, iii. 152 (1863); *Müll. Arg. in DC. Prodr.* xv. 2, 1053, *var.* elliptica *incl.* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 76, *var.* elliptica *omnino et var.* marginata *partim incl.* (1911). C. marginata, *E. Mey. in Drège, Zwei Pfl. Documente*, 174 [nomen], *quoad* b *tantum* (1843); *Sond.* l.c. 130, *partim et quoad spp. Dregeana in* Swellendam *lecta tantum* (1850). Penaea tomentosa, *Thunb. Prodr. Pl. Cap.* 30 (1794) et *in Fl. Cap. ed. Schult.* 150 (1823). Geissoloma tomentosum, *Juss. in Ann. Sc. Nat.* sér. 3, vi. 27 (1846).

Coast Region: Caledon, Bredasdorp and Swellendam Divs.

A double confusion has crept into the history of *C. tomentosa*. The species was based by Linnaeus on a male specimen despatched to him from the Cape by Governor Tulbagh on 25 April, 1763. This specimen is now in the Linnaean herbarium, where it bears Tulbagh's field number 129; it is written up as "tomentosa" by Linnaeus himself, and the same name is endorsed by Linnaeus opposite this number on Tulbagh's invoice list.

Subsequent to the publication of the description of Tulbagh's specimen in the second *Mantissa*, Linnaeus obtained from Thunberg a female specimen of a *Cluytia* which he wrote up as "tomentosa *Mant.* femina"; this specimen is still in the Linnaean herbarium. The latter, however, is not the female of *C. tomentosa*, Linn.; it has glabrous capsules, whereas the capsules of the true *C. tomentosa* are tomentose. What this second plant is has been a matter of debate. By Thunberg in his own herbarium a duplicate of this female plant, treated as *C. tomentosa*, doubtless on the strength of Linnaeus' verdict, has been pinned to a sheet bearing a male plant of *C. daphnoides*, Lamk. Sonder, in 1850, while leaving the male part of *C. tomentosa*, Thunb. non Linn., in *C. daphnoides*, has attributed the female part to a species issued, though with an expression of doubt, by E. Meyer in 1843, as *C. tomentosa*: upon *C. tomentosa*, E. Mey., non Linn., Sonder based his species *C. Thunbergii*, the name chosen having regard to the inclusion therein of the female portion of *C. tomentosa*, Thunb. non Linn. Müller, on the other hand, while recognising in 1866, as a distinct variety, the form which is *C. tomentosa*, E. Mey. non Linn., referred the female portion of *C. tomentosa*, Thunb. non Linn., as well as the male portion, to *C. daphnoides*. We have in this paper adopted Sonder's view rather than that of Müller, though with a feeling that perhaps the proper course to adopt is to regard the female part of *C. tomentosa*, Thunb. non Linn., as intermediate between *C. daphnoides*, Lamk., and *C. Thunbergii*, Sond., rather than as belonging to either. Sonder's view had, however, in a somewhat different form, been already formed and expressed by Willdenow. In herb. Willdenow there is a specimen (No. 18599) which matches exactly the one sent by Thunberg to Linnaeus. This specimen, like the female one of *C. tomentosa*, Thunb. non Linn. in herb. Thunberg, Müller has identified as *C. daphnoides*. But to Willdenow himself, who knew *C. daphnoides* quite well, and who actually published a good figure of that species, this specimen did not suggest *C. daphnoides* any more than it did *C. tomentosa*. Knowing that Thunberg had diagnosed a pubescent species as *C. pubescens*, and being without any example of that plant, Willdenow hazarded the guess that the plant in his herbarium which Sonder was, later on, to include in *C. Thunbergii*, Sond., might be *C. pubescens*.

The second confusion, to some extent a corollary of the first, was imported into the history of *C. tomentosa* by E. Meyer. Having come to the conclusion that the plant which Sonder was subsequently to describe as *G. Thunbergii* might be *C. tomentosa*, it is hardly surprising that when he did have to deal with the true *C. tomentosa*, Linn., Meyer failed to recognise it as being the plant of Linnaeus and issued it among Drège's plants, in 1843, under the manuscript name *C. marginata*, E. Mey. In so doing, however,

he confused it with another nearly allied but nevertheless distinct species. Sonder, in 1850, failed to observe that Meyer had issued two different plants under this name. Müller, in 1866, noticed the misidentification by Meyer which Sonder had accepted and treated that portion of *C. marginata*, E. Mey., which is not *C. tomentosa*, Linn., as *C. tomentosa*, var. *marginata*, Müll. Arg.; the portion of *C. marginata*, E. Mey., which is identical with *C. tomentosa*, Linn., was named by Müller *C. tomentosa*, var. *elliptica*, Müll. Arg. As Pax in 1911 has pointed out, there is no variety "elliptica" as apart from *C. tomentosa*, Linn., proper. Pax has not, however, given full effect to this conclusion; Drège's specimens from Swellendam, which are those upon which the variety *elliptica*, Müll. Arg., was founded, have been transferred by Pax from the variety of which they constitute the basis and placed by him in the variety *marginata*, from which Müller was careful to exclude them. By some inadvertence Pax has attributed the first publication of *C. tomentosa* to the *Mantissa Plantarum* of 1767 instead of to the actual place, which is the *Mantissa altera* of 1771.

4. **Cluytia marginata**, *E. Mey. in Drège, Zwei Pfl. Documente*, 174 [nomen], *quoad* a *tantum* (1843); frutex metralis; ramuli patentes, angulati, dense cinereo-tomentosi; folia firmiter papyracea, breviter petiolata, obovata, acuta, basi pedetentim cuncata, margine plana, patentia haud imbricata, 1·2–2·5 cm. longa, 6–8 mm. lata, utrinque dense cinereo-pubescentia; petiolus 2 mm. longus; flores dioici, albi, masculi axillares 1–3, feminei axillares solitarii; pedicelli breves, incanescenti-pubescentes; sepala maris dense incanescenti-pubescentia, ovato-oblonga, 5 mm. longa, glandula basali 7–9-loba aucta; petala distincte unguiculata, rhomboidea, extra parce pubescentia, glandula minuta instructa; ovarii rudimentum cylindricum, parce pubescens; sepala feminei ovato-oblonga, glandula basali indivisa aucta; petala calyce aequilonga, oblonga, extra pubescentia, glandula basali 2-loba aucta; ovarium tomentosum; styli breves, 2-fidi; capsula 8 mm. longa, fere 8 mm. lata, parce breviter tomentosa; semina nigra, nitentia. *Sond. in Linnaea*, xxiii. 130, *pro parte maxima, sed. spp. Drègeana in* Swellendam *lecta excl.* [nomen] (1850); *Baill. Adansonia*, iii. 152 [nomen] (1862). C. tomentosa, *var.* marginata, *Müll. Arg. in DC. Prodr.* xv. 2, 1053, *omnino* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 76, *partim* (1911). C. incanescens, *Hort. in hort. Kew.*

Coast Region: Ladismith Div.; Kannaland, between Cogman's Kloof and the Gouritz River, *Ecklon & Zeyher*, 67. George Div.; Montagu, *Marloth*, 2831.

Central Region: Beaufort West Div.; Nieuweveldebergen near Beaufort West, 3000–5000 ft., *Drège*, letter a.

This species, after having been in cultivation at Kew in the early part of the nineteenth century under the name *C. incanescens*, seems to have been lost without being replaced. The specimens collected by Marloth in 1903 agree well with those of Ecklon and Zeyher from Kannaland and those of Drège from Beaufort West. Specimens raised at Berlin from seed of Marloth 2831 agree very well with *C. incanescens*, Hort., preserved at Kew. No full description of this species has so far been given.

5. **Cluytia sericea**, *Müll. Arg. in DC. Prodr.* xv. 2, 1053 (1066); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 75, fig. 24 A (1911).

Coast Region: Malmesbury Div.

6. **Cluytia Katharinae**, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 58 (1911). C. sericea, *Harv. MSS. in T. C. D.*; *non Müll. Arg.*

Coast Region: Queenstown Div.

Eastern Region: Pondoland, Griqualand East and Natal.

¶ 3. **Alaternoideae**, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 67 (1911), *ampl. et emend. et* C. crassifolia *exclus.*—Folia haud ericoidea, coriacea, glabra vel rarissime (*C. pubescens*) pubescentia, opaca vel raro (*C. pterogona*) pellucido-punctata, margine nunc plana nunc revoluta; petala feminei basi eglandulosa; ovarium glabrum vel raro (*C. pubescens*) hirsutum; capsula glabra vel raro (*C. pubescens*) parce tomentosum. *Revolutae*, Pax et K. Hoffm. l. c. (1911) sed *C. polygonoide* exclus.—Species 11; *C. pubescens*, *C. pterogona*, *C. polifolia*, *C. brevifolia*, *C. virgata*, *C. laxa*, *C. africana*, *C. Alaternoides*, *C. imbricata*, *C. rubricaulis*, *C. ovalis*.

7. **Cluytia pubescens**, *Thunb. Prodr. Pl. Cap.* 53 [Clutia] (1794) et *in Fl. Cap. ed. Schult.* 270 (1823); *Krauss in Flora*, xxviii. 82 (1845); *Sond. in Linnaea*, xxiii. 124, *var.* β glabrata *incl.* (1850); *Baill. in Adansonia*, iii. 152, *var.* β glabrata *incl.* (1862); *Müll. Arg. in DC. Prodr.* xv. 2, 1053 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 80 (1911). C. acuminata, *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *partim et quoad* b *tantum*; *nec Linn. f.*, *nec Thunb.* (1843). C. humilis, *Bernh. ex Krauss* l.c. 81 (1845). C. Eckloniana, *Müll. Arg.* l.c. 1054 (1866). C. Rustii, *Knauf, Geogr. Verbr. Cluytia*, 49, 54 (1903). C. glabrata, *Pax* l.c. (1911). C. intertexta, *Pax* l.c. (1911). C. fallacina, *Pax* l.c. (1911).

Coast Region: Van Rhynsdorp, Piquetberg, Tulbagh, Paarl, Cape, Stellenbosch, Caledon, Riversdale and Fort Beaufort Divs.

Central Region: Prince Albert and Cradock Divs.

8. **Cluytia pterogona**, *Müll. Arg. in DC. Prodr.* xv. 2, 1048, *var. amb. inclus.* (1866); *Pax. in Engl. Pflanzenr.—Euphorb. Cluyt.* 78, fig. 26 F, *var. amb. incl.* (1911). C. alaternoides, *Willd. Sp. Pl.* iv. 879 *partim; nec Linn.* (1805). C. alaternoides, γ [angustifolia], *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* b *tantum* (1843). C. polygonoides, var. heterophylla, *Krauss in Flora*, xxviii. 82 (1845). C. polygonoides, var. angustifolia, *Krauss* l.c., *partim et quoad spp. capens. tantum* (1845). C. alaternoides, γ lanceolata, ββ revoluta, *Sond. in Linnaea*, xxiii. 128, *partim et loc. omn. excl.* (1850). C. polifolia, *Sond.* l.c. 124 (1850); *Baill. Adansonia*, iii. 151 (1862); *nec. Jacq.* C. lavandulifolia, *Reichb. MSS. ex Pax* l.c. (1911).

Coast Region: Paarl and Cape Divs.

This species resembles so closely the plant which is known as *C. Alaternoides*, γ *angustfolia*, E. Mey., that the two have been confused both by Meyer himself and by Krauss. However, these authors were not the earliest to make this mistake, because the opening folio of herb. Willdenow n. 18592, intended by Willdenow to represent *C. Alaternoides*, Linn., is really *C. pterogona* Müll. Arg. Sonder, in 1850, was the first to realise that this is a distinct species, though he was so unfortunate as to decide that it was the plant figured by Jacquin in 1797 as *C. polifolia*. As a result

Sonder not only was prevented from providing *C. pterogona* with the distinctive name of which it stood in need; he was led to propose an unnecessary name for the real plant of Jacquin, from which among other things *C. pterogona* differs in having leaves with translucent patches and stems with erosely-denticulate wings.

When rectifying Sonder's misapprehension Müller, in 1836, cited for his newly named species only localities in the Cape Peninsula. In so doing it would appear that Müller was very nearly justified; the only division, outside the limits of the Cape Peninsula, whence perfectly authentic examples of *C. pterogona* have been reported, is Paarl. An examination of the evidence available shows that it is only the Table Mountain (Cape Div.) portion and not, as Sonder has stated, the Winterberg (Fort Beaufort Div.) portion of 'Ecklon & Zeyher n. 62' which belongs to this species: also, that it is only the Cape Flats (Cape Div.) portion of *C. polygonoides*, var. *angustifolia*, Krauss, and not, as Pax has been led to believe, the Winterhoek (Uitenhage Div.) portion of Krauss' variety that is referable to *C. pterogona*. It has, however, to be added that there is now in herb. Holm. a specimen of *C. pterogona*, which once belonged to Sonder, which bears the notation 'E. & Z. 64. 9' and therefore, if this notation be correct, ought to have come from the banks of the Karega River (Bathurst Div.). But this record is so doubtful that until authentic evidence to the contrary is forthcoming we are disposed to assume that the species is, as Müller supposed, confined to the extreme south-west of Cape Colony, and to doubt the extension eastwards (by oversight written 'westwards') to Grahamstown which Pax has postulated. The recognition of two varieties, insisted upon by Müller and by Pax, is unnecessary. As in most other species of the group to which it belongs the leaves on young twigs of *C. pterogona* are manifestly shorter than the leaves on the main branches. But all specimens do not happen to have young twigs developed when they are collected. If a specimen chances to be without young twigs its leaves are uniform in length; if it happens to have developed its young twigs its leaves are of different lengths and the plant is in the condition—for it is only a condition—to which Krauss, Müller and Pax have given the varietal name "heterophylla."

9. **Cluytia polifolia**, *Jacq. Hort. Schönbr.* ii. 67, t. 250 (1797). *Willd. Sp. Pl.* iv. 2, 880 (1805); *Pers. Synops.* ii. 636 (1807); *Poir. Encyc. Meth. Suppl.* ii. 302 (1810); *Spreng. Syst.* iii. 49 (1826); *Dietr. Synops.* v. 455 (1852). C. polifolia, *a* genuina, *Müll. Arg. in DC. Prodr.* xv. 2, 1049 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 77 (1911). C. acuminata, *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *tantum* (1843) et *ex Sond. in Linnaea*, xxiii. 25, *omnino* (1850); *nec Linn. f., nec Thunb.* C. teretifolia, *Sond.* l.c. 124 (1850); *Baill. Adansonia*, iii. 152 (1862). C. brevifolia, *Sond.* l.c. 125, *pro parte minima et quoad Drège* 8230 *tantum* (1850). C. Meyeriana, *Müll. Arg.* l.c. 1055 (1866); *Pax* l.c. 79 (1911). C. polifolia, β teretifolia, *Müll. Arg.* l.c. (1866); *Pax* l.c. (1911). C. polifolia, γ cinerascens, *Müll. Arg.* l.c. (1866); *Pax* l.c. (1911). C. polifolia, δ brevifolia, *Pax* l.c., *pro parte minima et quoad Diels* 595 *tantum* (1911).

Coast Region : Van Rhynsdorp, Clanwilliam, Piquetberg, Malmesbury, Worcester, Swellendam, Riversdale, George, Knysna, Uniondale, Uitenhage and Port Elizabeth Divs.

Central Region : Prince Albert Div.

C. polifolia is most nearly allied to *C. pterogona*, Müll. Arg. but is readily distinguished by its unwinged stems and its opaque leaves. It is noteworthy that, widely spread as *C. polifolia* is, there are no specimens from the particular area to which *C. pterogona* appears to be confined. The variety β *teretifolia*, recognised by Müller, has no real existence, its origin being purely bibliographical. Sonder in 1850 believed the species which is really *C. pterogona* to be *C. polifolia*, Jacq., and wrote up his material in accordance with this belief. Being thus left without a name for Jacquin's species, Sonder took the latter to be a novelty which he described as *C. teretifolia*. As in *C. pterogona*, the leaves on young twigs of *C. polifolia* are manifestly shorter than the leaves on the main branches. If, as chances to have been the case with the plant figured by Jacquin, young twigs are not yet developed, then the leaves are uniform in length. When there are young twigs the leaves thereof are shorter than those of the main-branches and we have the condition—for it is only a condition—to which Müller in 1866 gave the specific name *C. Meyeriana*. The plant which Müller in 1866 treated as γ *cinerascens* is a somewhat robust and unusually rigid state of *C. polifolia*, almost as little entitled as *C. Meyeriana* is to separate recognition. On the other hand the reduction by Müller of *C. brevifolia*, Sond., to the position of a variety of *C. polifolia* is very nearly as inconvenient as the proposed recognition, as a species apart, of *C. Meyeriana*.

10. **Cluytia brevifolia**, *Sond. in Linnaea*, xxiii. 125, *cit. Drège* 8230 *excl.* (1850) ; *Baill. Adansonia*, iii. 153 *excl. syn. E. Mey.* (1862). C. polifolia, δ brevifolia, *Müll. Arg. in DC. Prodr.* xv. 2, 1049 (1866) ; *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 77 (1911).

Coast Region : Humansdorp, Uitenhage and Port Elizabeth Divs.

Though treated by Müller as a variety of *C. polifolia*, Jacq., this seems a very distinct species with a somewhat limited and quite compact distribution. The localities Grahamstown and Stellenbosch, cited for *C. brevifolia* by Sonder, prove, on critical examination, to depend upon a misapprehension on Sonder's part as to the provenance of his specimens. Similarly the plants from the Van Rhynsdorp and Clanwilliam Divs., referred here by Pax, are found on examination not to belong to *C. brevifolia*, but to the condition of *C. polifolia* which Müller termed *C. Meyeriana*. Sonder himself has made a suggestion that *C. imbricata*, E. Mey., might perhaps be a form of *C. brevifolia* ; this suggestion Baillon ventured to give effect to. We now know that whatever its taxonomic relationship to *C. brevifolia* may be, *C. imbricata*, E. Mey. differs morphologically from *C. brevifolia* in having stomata on both surfaces of its leaves.

11. **Cluytia virgata**, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 71 (1911).

Kalahari Region : Transvaal ; Ermelo, Barberton and Swaziland Dists.

Eastern Region : Pondoland and Natal.

A species very closely allied to and perhaps hardly specifically distinct from *C. Alaternoides*, Linn. It is readily recognised by having simple in place of branching stems. It has, however, to be borne in mind that this is a character such as might be expected in a plant sending up fresh shoots from a woody base after veldt fires.

12. **Cluytia laxa**, *Eckl. ex Sond. in Linnaea*, xxiii. 128 (1850); frutex 30–60 cm. altus; caules graciliores, lignosi, crebre ramosi; ramuli subpatentes, glabri; folia sessilia, coriacea, opaca, lanceolata, obtusa apice mucronulata, basi roundata, margine parce scabridula saepissime plana, 6–12 mm. longa, 3–4 mm. lata, utrinque glaberrima, pallide viridia; internodia vix angulata vix 3 mm longa; flores dioici, albi, subsessiles, maris in glomerulas paucifloras aggregati; feminei solitarii; utriusque sexus versus ramulorum apices densiuscule aggregati; sepala maris obovata, obtusa, glandula basali 3-loba aucta, petala late obovata, cuneatim unguiculata, basi 2-glandulosa; ovarii rudimentum glabrum; sepala feminei elliptico-lanceolata, ea maris superantia, glandula basali 3-loba aucta; petala oblongo-obovata, eglandulosa; ovarium glabrum; styli liberi, 2-fidi; capsula subglobosa, 4 mm. lata; semina nigra, nitentia. C. Alaternoides, *Sims, Bot. Mag.* t. 1321 (1810); *Ait. Hort. Kew.* ed. 2, v. 422, *partim* (1813); *nec Linn.* C. Alaternoides, β intermedia, *Sond.* l.c., *pro parte maxima* (1850); *Baill. Adansonia*, iii. 150 (1862). C. Alaternoides, γ lanceolata, *aa* planifolia, *Sond.* l.c. *syn. Willd. excl.* (1850); *Baill.* l.c. (1862). C. alaternoides, ζ lanceolata, *Müll. Arg. in DC. Prodr.* xv. 2, 1048 (1866). C. alaternoides, γ angustifolia, 1 lanceolata, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 70, fig. 22 B (1911); *nec* γ angustifolia, *E. Mey.*

Coast Region: Riversdale Div., Garcia's Pass, *Phillips*, 370. Oudtshoorn Div.; near Oudtshoorn, *Miss Britten*, 89. Knysna Div.; near Knysna, *Newdegate*. Uitenhage Div.; Uitenhage, *Ecklon & Zeyher*, 42: Elands River, *Ecklon*; *Ecklon & Zeyher*, 59. Port Elizabeth Div.; near Port Elizabeth, *Bolus*, 2243; *Mrs. Paterson*, 1109; Walmer, *Mrs. Paterson*, 832. Albany Div.; at Soutar's Post, *Burchell*, 3504; Grahamstown, *Williamson; Macowan*, 27; *Rogers*, 66, 3995; Stone's Hill, *Schönland*, 72; Currie's Kloof, *Schönland*, 576; Kaboussie, *Macowan*, 325; Harvey's Post, *Galpin*, 78. Queenstown Div.; Hangklip Mountains, 1600–2000 m., *Galpin*, 1621, 1622; Stormberg, *Wyley*. Stutterheim Div.; Fort Cunynghame, *Sim*, 2180. Komgha Div.; near the mouth of the Kei River, 60 m., *Flanagan*, 1149. British Kaffraria; without precise locality, *Cooper*, 78, 79.

Kalahari Region: Transvaal; Lydenburg, *Wilms*, 1318. Barberton, 900 m., *Galpin*, 934.

Eastern Region: Transkei; Kentani, 300 m., *Miss Pegler*, 1250. Natal; Alexandra County, Dumisa, at Fairfield, 750 m., *Rudatis*, 679; between Pietermaritzburg and Greytown, *Wilms*, 2270.

Though *C. laxa*, Eckl., has already been fully described and figured by Sims in 1810 in the *Botanical Magazine* it was there confused with and, at least in intention, treated as part of *C. Alaternoides*, Linn. The first author to recognise the claim of this plant to separate recognition was Müller, who, in 1866, treated it as a distinct variety of the Linnean species. Pax, in 1911, declining to

accept Müller's arrangement, has merged this plant in Müller's var. *angustifolia*. This treatment is rather less natural than that of Müller because, as will be shown presently, it is var. *angustifolia*, Müll. Arg., and not, as Müller supposed, the variety which Müller termed *γ genuina*, which is the true *C. Alaternoides* of Linnaeus. Pax has treated *C. Alaternoides* as the type of a distinct section, *Alaternoideae*, which by his definition is only separable from another section, *Revolutae*, also proposed by him, owing to the circumstance that in the *Alaternoideae* the leaves bear stomata on both surfaces, whereas in the *Revolutae* the leaves bear stomata only on the under surface. It so happens, however, that in *C. laxa* the stomata are almost always confined to the lower surface of the leaves only, and if this character, which is of interest owing to its possible oecological significance, had all the taxonomic value which Pax has assigned to it, then *C. laxa*, so far from being treated as 'a form of a variety' of *C. Alaternoides*, might be treated as a distinct species belonging to another section. The writer is not disposed to consider the character afforded by the distribution of the stomata as one of sufficient importance to justify the establishment of sections, but when, as in the present instance, it is found associated with certain other adequate morphological peculiarities, we are perhaps justified in regarding *C. laxa*, Eckl., at least tentatively, as a distinct species. But the natural relationships of these various nearly allied Cluytias can only be settled in the field by one or other of the competent local botanists now at work in South Africa.

13. **Cluytia africana**, *Poir. Encyc. Meth. Suppl.* ii. 302 [Clutia], *syn. Willd. excl.* (1810); suffrutex ad 60 cm. altus; caules crassi, lignosi, saepius copiose ramosi; ramuli ascendentes, glabri; folia sessilia, crasse coriacea, opaca, oblongo-obovata, obtusa apice mucronulata, basi cuneata rarius rotundata rarissime minopere cordata, margine scabridula parum revoluta, 4–4·5 cm. longa, 1·2–1·8 cm. lata, utrinque glaberrima, hebetia, siccitate brunnea; internodia 5–10 mm. longa; flores dioici, pallide lutei, utriusque sexus solitarii, pedicellati; pedicelli glabri, 5 mm. longi, maris graciles, feminei fructigeri rigidi robustiores; sepala maris obovata, obtusa, basi glandula 3-loba aucta; petala late obovata, cuneatim unguiculata, basi 2-glandulosa; ovarii rudimentum turbinatum, glabrum; sepala feminei elliptico-lanceolata, ea maris superantia, basi glandula 3-loba aucta; petala oblongo-obovata, eglandulosa; ovarium glabrum; styli liberi, 2-fidi; capsula subglobosa, 5 mm. lata, glabra; semina nigra, nitentia. C. Alaternoides, *Linn. Sp. Pl.* 1042, *partim et quoad syn. Comm. tantum* (1753) et *ibid.* ed. 2, 1475, *partim et quoad syn. Comm. tantum* (1763); *Lamk Encyc. Meth.* ii. 54, *partim et quoad syn. Comm. tantum* (1786); *Thunb. Prodr. Cap.* 53, *pro parte maxima* (1794), et *Fl. Cap. ed. Schult.* 270, *pro parte maxima* (1823); *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *et* d *tantum* (1843); *Krauss in Flora*, xxviii. 82 (1845). C. daphnoides, *Willd. in Hort. Berol.* 52, *excl.* t. 52 (ante 1805), et *Sp. Pl.* iv. 2, 880, *quoad syn. Comm. tantum* (1805); *nec Lamk* C. Alaternoides, *var.* major, *Krauss* l.c. (1845); *Müll. Arg. in DC Prodr.* xv. 2, 1047 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 68, *pro parte maxima* (1911). C. Alaternoides, *a* latifolia, *Sond. in Linnaea*, xxiii. 127, *partim* (1850); *Müll. Arg.* l.c. (1866).

C. floribunda, *Baill. Étud. gén. Euphorb. Atl.* 30, t. xvi. fig. 1–5 (1858) ; *fide Pax.* C. heterophylla, *Baill. Adansonia*, iii. 150, *quoad spp. cit. sed syn. Bernh. excl.* (1862) ; *nec Thunb.* C. Alaternoides, γ genuina, b oblongata, *Müll. Arg.* l. c. (1866).

Coast Region : Clanwilliam Div. ; Cedarberge, near the Honey Valley and the Koudeberg, 800–1200 m., *Drège*, 8228 b ; *Diels*, 906. Piquetberg Div. ; near Piquetberg, *Drège*, 8228 a : Oliphants River near Warm Baths, *Stephens*, 7223 ; *Phillips*, 7254. Paarl Div. ; Paarl Mountain and by the Berg River near Paarl, *Drège.* Cape Div. ; numerous localities, *Sparrmann* ; *Thunberg* ; *Bergius* ; *Mund & Maire* ; *Lichtenstein* ; *Drège*, a ; *Burchell*, 260 ; *Ecklon* ; *Ecklon & Zeyher* ; *Prior* ; *Pappé* ; *Hooker*, 616 ; *Harvey*, 24, 112 ; *C. Wright*, 452 ; *Dubuc* ; *Bolus*, 4586 ; *Miss Cole* ; *Rehmann*, 1394, 2028 ; *Wolley Dod*, 608, 2743 in part, 2799 ; *Wilms*, 3612 ; *Dümmer*, 27, 97, 1449, 1451. Stellenbosch Div. ; Hottentots Holland, *Mund & Maire.*

In herb. Holm. there is a specimen of this plant marked in an unrecognised script "Gueinzius 205" and subsequently noted by Sonder as being also from Hottentots Holland. In herb. Berol. another specimen is marked "Eckl. & Zeyh. 49. 93. 3" the locality of which, if these figures were correct, should be Port Elizabeth. But there is no corroboration of this rather unexpected distribution and the Port Elizabeth locality should be considered doubtful.

Cluytia africana was well figured by Commelin (Hort. Amst. ii. 3, t. 2) in 1701, but was treated by Linnaeus in 1753 and again by Lamarck in 1786 as only a form of another species well figured by Burmann (Rev. Afr. Pl. 116, t. 43, fig. 1) in 1739. Though Linnaeus proposed this bibliographical union he did not, as we now know, associate any specimens of Commelin's plant with that of Burmann, and it is therefore hardly matter for surprise that Willdenow should have been unable to accept the arrangement of Linnaeus and Lamarck. But Willdenow only escaped the confusion his predecessors had created in order to give rise to another, because he identified Commelin's plant, sometime prior to 1805 (Hort. Berol. 52), with one which Lamarck had described as *C. daphnoides.* This new error was corrected by Poiret in 1810 (Encyc. Meth. Suppl. ii. 302), though Poiret was led into yet a third because of his assuming that the *C. daphnoides* of Willdenow could not well be the *C. daphnoides* of Lamarck. In coming to this conclusion Poiret's own judgment was at fault for the plant figured by Willdenow as *C. daphnoides* is really the plant described under that name by Lamarck. Poiret's action was consistently ignored until 1866, when Müller, failing to observe that Poiret's error lay in his having been misled in his estimate of Willdenow's judgment, misunderstood and misinterpreted Poiret's proposition. In 1845 Krauss, who does not quote Poiret, arrived independently at the same conclusion and treated *C. africana* as distinct from *C. Alaternoides* ; unfortunately it was to *C. africana* that Krauss attributed the name "Alaternoides" while the real *C. Alaternoides* he included in *C. polygonoides*, Krauss, his conception of which was the same as that of Willdenow and therefore altogether different from that of Linnaeus. In applying the name *C. Alaternoides* to this particular plant Krauss was only doing what, as we learn from their specimens, Thunberg and E. Meyer

intended to do and Burchell actually did. Nor is the reason for the action of these authorities difficult to understand. Being without access to the Linnaean herbarium, they had not learned that this plant is not the one which there serves as a representative of *C. Alaternoides*, Linn., or that Linnaeus, when he did finally obtain specimens of this plant, had not ventured to write it up as *C. Alaternoides*. All that they did know, and all that they had to guide them, was the circumstance that the plant with which they were dealing was the plant to which Commelin had given the name—*Alaternoides*—which Linnaeus used for it. In 1858 Baillon, again independently, reached the sound conclusion of Poiret and of Krauss, for *C. floribunda*, Baill., is identical with *C. africana*, Poir. In 1862 Baillon was still of the same opinion because, though he abandoned the name *C. floribunda*, his specimens show us that what he took to be *C. heterophylla* was not the true *C. heterophylla* of Thunberg but was *C. africana*, Poir. Krauss in 1845 separated from the others as var. *major* those specimens of *C. africana* with very large leaves ; Sonder in 1850 recognised a variety, *α latifolia*, of *C. alaternoides*, Linn. Müller in 1866 adopted both the variety *latifolia* of Sonder and the variety *major* of Krauss. In so doing Müller treated Sonder's *latifolia* as the equivalent of *C. Alaternoides*, Krauss, non Linn., and took *C. Alaternoides β major* of Krauss to be the precise equivalent of Commelin's plant named by Poiret *C. africana*. This was an error of refinement. There is no doubt that what Sonder termed *C. Alaternoides α latifolia* was intended to include, and his specimens show that it did include, both *C. Alaternoides*, Krauss, non Linn., and *C. alaternoides β major*, Krauss. On the other hand there is no doubt that except in size of leaf there is no difference between Krauss's two varieties and that both belong to the plant figured by Commelin and named *C. africana* by Poiret. The action of Pax, in his careful study of the forms that have from time to time been labelled *C. Alaternoides*, in treating as a single entity the two varieties, *latifolia* and *major* of Müller, is therefore fully justified ; he has thus reverted to the position taken up by Poiret in 1810, by Krauss in 1845, and by Baillon in 1858 and 1862, with this difference that Pax, like Sonder, has treated as a variety of *C. Alaternoides* what Poiret and Krauss and Baillon have, under various names, regarded as a distinct species. In adopting the view of Poiret and Baillon in preference to that of Sonder and Pax, and in treating *C. africana* as a distinct species, no regard has been paid to the fact that *C. africana*, Poir., is another of those species with stomata on the under surface of the leaf only and not on both surfaces, as is the case in *C. Alaternoides*, Linn., the species with which *C. africana* has been so greatly confused.

14. **Cluytia Alaternoides**, *Linn., Sp. Pl.* 1042, *syn. Burm.* t. 43, fig. 3 *et syn. Comm. excl.* [Clutia] (1753), et *ibid. ed.* 2, 1474, *syn. eadem excl.* (1763) ; *Burm. f. Prodr. Fl. Cap.* 27 bis [31] (1768) ; *Lamk Encyc. Meth.* ii. 54, *syn. Comm. excl.* (1786) ; *Ait. Hort. Kew*, iii. 419 (1789) ; *Willd. Hort. Berol.* 50, t. 50 (ante 1805), et *Sp. Pl.* iv. 2, 879, *partim* (1805) ; *Pers. Synops.* ii. 636 (1807) ; *Ait. Hort. Kew*, ed. 2, v. 422 *partim* (1813) ; *Spreng. Syst.* iii. 49 (1826) ; *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a a *partim et quoad* c (1843); *Dietr. Synops.* v. 455 (1852) ; *Baill. Adansonia*, iii. 150, *quoad syn.*

Willd. (1862). C. polygalaefolia, *Salisb. Prodr.* 390 (1796). C. Alaternoides, β intermedia, *Sond. in Linnaea*, xxiii. 128, *quoad syn. Burm. sed excl. syn. E. Mey.* (1850). C. Alaternoides, γ lanceolata, Sond., l.c. *quoad syn. Willd. tantum* (1850). C. Alaternoides, ε angustifolia, a longifolia, *Müll. Arg. in DC. Prodr.* xv. 2, 1048 (1866); *nec tamen* γ angustifolia, *E. Mey.* C. Alaternoides γ angustifolia, 1 lanceolata, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 70 *pro parte* (1911); *nec* γ angustifolia, *E. Mey.* C. angustifolia, *Burch. MSS. in herb. Kew, nec Knauf.*

Coast Region: Clanwilliam, Piquetberg, Worcester, Paarl, Cape, Caledon, Riversdale, George, Knysna, Uitenhage, Bathurst and Albany Divs.

Eastern Region: Transkei.

Var. β **brevifolia**, *E. Mey. ex Sond. in Linnaea*, xxiii. 128 (1850); frutex elatus, 2–3-metralis; caules ramulique typi; folia typi nisi breviora—longitudine nunquam 1·2 cm. excedentia saepissime breviora; internodia saepe manifeste angulata nonnunquam alata. C. Alaternoides, *Thunb. Prodr. Pl. Cap.* 53, *partim* (1794) et *in Fl. Cap. ed. Schultes* 270, *partim* (1823); *vix Linn.* C. Alaternoides, β [brevifolia], *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *tantum* [nomen] (1843). C. Alaternoides, γ genuina, c brevifolia, *Müll. Arg. in DC. Prodr.* xv. 2, 1048 (1866). C. Alaternoides, γ genuina, c imbricata, *Mull. Arg.* l.c. (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 70 (1911). C. Alaternoides, β genuina, 3 elliptica, *Pax* l.c., *partim* (1911); *nec Müll. Arg.* C. angulata, *Burch. MSS.* C. myrtifolia, *Burch. MSS.*

Coast Region: Paarl, Cape, Stellenbosch, Caledon, Swellendam, George, Knysna, Uitenhage and Albany Divs.

Var. γ **angustifolia**, *E. Mey. ex Sond. in Linnaea*, xxiii. 128, *pro parte tantum* (1850); frutex elatus; caules ramulique typi; folia longitudine nunquam 8 mm. excedentia, margine manifeste revoluta; internodia manifeste angulata vel subalata sed angulis vix membranaceis nunquam eroso-denticulatis. C. Alaternoides, γ [angustifolia], *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *tantum* [nomen] (1843). C. Alaternoides, γ lanceolata, ββ revoluta, *Sond.* l. c., *pro parte tantum* (1850). C. Alaternoides, ε angustifolia, c leptophylla, *Müll. Arg. in DC. Prodr.* xv. 2, 1048 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 70 (1911).

Coast Region: Mossel Bay Div.

In the account which has already been given of the specimens in the Linnean herbarium the necessity for restricting the name *C. Alaternoides* to the first of the three distinct species to which the name was applied in 1753 has been explained. In the account of the Thunbergian herbarium it has already been noted that although *C. Alaternoides*, Thunb., also includes three forms, none of Thunberg's plants is precisely *C. Alaternoides*, Linn.; the nearest to the Linnean plant in Thunberg's herbarium is one which is referable to *C. Alaternoides*, β *brevifolia*, E. Mey.

C. Alaternoides was early introduced to European gardens for, in spite of the possibility of confusion between it and other nearly allied species, we learn from Burmann's figure that it was in cultivation in Holland in 1738 (Rar. Afr. Pl. 116, t. 43, fig. 1), and from Willdenow's figure (Hort. Berol. 50, t. 50) that it was

in cultivation in Germany before 1805. From specimens we know that this is the *C. Alaternoides* of the first edition of the *Hortus Kewensis* (1789) and is the *C. polygalaefolia* of Salisbury's Chapel Allerton *Prodromus* (1796). From Willdenow we learn (Hort. Berol. 51, t. 51) that a nearly allied species, *C. rubricaulis*, was in cultivation at Berlin prior to 1805, under the erroneous name *C. polygonoides;* and from specimens we learn that this same species, under the equally erroneous name *C. Alaternoides*, was in cultivation from 1820 to 1822 in Paris. But *C. rubricaulis* was not the first species to find its way into our gardens under the name of the older *C. Alaternoides;* sometime before 1810 yet another species, *C. laxa*, had found its way to England, there to be mistaken for *C. Alaternoides* and to be figured by Sims under that name.

There is no serious difficulty, when some attention is paid to their leading characteristics, in separating *C. Alaternoides* from the particular variety of *C. rubricaulis* (*C. rubricaulis* var. *grandifolia*) with which it has, on the whole, been most often confused. The mixture of *C. Alaternoides* with *C. africana*, Poir., on the one hand, or with *C. laxa*, Eckl., on the other, is less difficult to avoid. It is, however, a matter for discussion whether *C. Alaternoides* may not, after all, in spite of the absence of any character readily appreciable in the herbarium, be even more distinct from the two varieties proposed by E. Meyer and here recognised than it is from the various species above alluded to. The only really tangible feature, so far as specimens and field-notes go, which enables the separation of the original *C. Alaternoides*, Linn., from E. Meyer's varieties β *brevifolia* and γ *angustifolia*, seems to be the circumstance that the plant of Burmann and Linnaeus is a small undershrub 1–2 feet high, whereas the other two are shrubs 7–10 feet high. It will be noted that in the field Burchell, whose *C. Alaternoides*, as has been already explained, was really *C. africana*, Poir. (*Alaternoides africana*, &c., Comm.), judged the true *C. Alaternoides* to be a species distinct both from *C. africana* on the one hand, and from E. Meyer's two varieties on the other. It will be noted further that Burchell has not, in the field, distinguished E. Meyer's two varieties, both of which he actually collected, from each other, but that he has applied two names in the field to E. Meyer's var. β *brevifolia*. These names are, however, so used by Burchell as to suggest that he may have intended to treat his "*C. angulata*" as only a variety of his "*C. myrtifolia*" and that he may therefore have thought of subdividing his *myrtifolia* along a different cleavage plane from that selected by E. Meyer. More than one competent South African field-botanist has expressed to the writer his conviction that there must be something seriously amiss with a systematic scheme, elaborated in a herbarium, which treats as conspecific the dwarf *C. Alaternoides* of the Cape Peninsula and the ten-foot bush which is so characteristic of the southern coast division from Swellendam to Uitenhage. The difficulty in coming to a decision on this point is, however, enhanced by the difficulty in ascertaining which of the several dwarf species met with in the Cape Peninsula is being mentally pictured by a South African

botanist when the contrast in question is made. As to this latter problem, the difficulty is nowhere better stated than it has been by the late Professor Harvey in a half-pathetic note on a sheet of *C. africana* of his own collecting:—"If there be two there are half a dozen species of Cluytia here. A very variable plant or group." The writer is satisfied that Burchell's "*C. myrtifolia*" is very distinct from and should never have been confounded with *C. africana*, or *C. rubricaulis*, or *C. laxa*, or *C. pterogona*, and it would not surprise him greatly to learn that *C. myrtifolia*, Burch., is equally distinct from the true *C. Alaternoides*. But apart from their great difference in size, the distinguishing features elude him, and it must be left to South African botanists to say whether the judgment formed by Burchell in the field is really so little deserving of consideration as the action taken by Meyer, Sonder, Müller and Pax would suggest.

15. **Cluytia imbricata**, *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *tantum* [nomen] (1843); fruticulus erectus, 60 cm. altus; caules graciliores lignosi, valde intricatim ramosi; ramuli glabri; folia sessilia, dense imbricata, coriacea, opaca, obovato-oblonga, obtusa apice minutissime mucronulata, versus basin gradatim attenuata, margine minutissime scabrida, parum revoluta, 5 mm. longa, 2 mm. lata, utrinque glaberrima, glauca; internodia teretia, brevissima; flores dioici, albi, pedicellati, maris in glomerulas paucifloras dispositi, feminei solitarii; pedicelli glabri; sepala maris obovata, obtusa, glandula basali 3-loba aucta; petala late obovata, cuneatim unguiculata, basi 2-glandulosa; ovarii rudimentum turbinatum, glabrum; sepala feminei elliptico-lanceolata, glandula basali 3-loba aucta: petala oblongo-obovata, eglandulosa; ovarium glabrum; styli liberi, 2-fidi; capsula subglobosa, 4 mm. lata; semina nigra, nitentia. *Sond. in Linnaea*, xxiii. 125 [nomen] (1850); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 83 [nomen] (1911).

Western Region: Little Namaqualand; Khamiesberg, between Pedro's Kloof and Leliefontein, *Drège*, a; 3030; near the summit of Beacon Hill, *Pearson*, 6710 partly; near stream in Groene Kloof, *Pearson*, 6617.

Sonder has suggested that this species, which has never been properly described, may be only a form of *C. brevifolia*, Sond. This is not the case; *C. brevifolia* is nearly allied to *C. polifolia* and has by Müller been treated as a variety of *C. polifolia*, whereas *C. imbricata*, as E. Meyer himself has indicated, is so nearly allied to *C. rubricaulis*, Eckl., that one form of the latter was issued by Meyer as *C. imbricata*, b. To Baillon (Adansonia, iii. 153) the suggestion of Sonder appeared so satisfactory that he actually reduced *C. imbricata* to *C. brevifolia*. It is not convenient to follow Baillon in this action because *C. brevifolia* is one of the forms with stomata on the under side of the leaf only, whereas both of the plants issued by E. Meyer as *C. imbricata* have stomata on both sides of their leaves. The main difference between the two plants issued by E. Meyer as *C. imbricata*, a and *C. imbricata*, b respectively, lies in the fact that the leaf-edges in 'a' are revolute, in 'b' are quite flat. But it has to be kept in mind that these two plants issued as 'a' and 'b' were both collected by Drège at the same time and in the

same place, and it has further to be noted that in another locality in the same region, Professor Pearson, an equally careful collector, has, as his n. 6710, issued the very same combination. It is therefore a matter for attention by field-botanists in South Africa as to whether after all Drège and Pearson may not be fully justified in considering the two plants conspecific. If it should be found that E. Meyer was right in accepting Drège's judgment, and that Sonder was wrong in doubting it, the question will arise as to whether one of the plants here included in *C. rubricaulis* var. *tenuifolia* had not better be transferred to *C. imbricata*.

16. **Cluytia rubricaulis**, *Eckl. ex Sond. in Linnaea*, xxiii. 128 (1850); fruticulus erectus ad 60 cm. usque altus; caules rigidi, lignosi, satis copiose ramosus; ramuli ascendentes, glabri; folia sessilia, dense imbricata, coriacea, opaca, oblongo-ovata. obtusa apice mucronulata, basi rotundata vel late cuneata, margine scabrida, plana, 1·2 cm. longa, 5 mm. lata, utrinque glaberrima, glauca; internodia teretia, brevissima; flores dioici, albi, pedicellati, maris in glomerulas paucifloras dispositi, feminei solitarii, pedicelli glabri, maris graciles 4 mm. longi, feminei fructigeri rigidi, crassiores, 5–6 mm. longi; sepala maris obovata, obtusa, glandula basali 3-loba aucta; petala late obovata, cuneatim unguiculata, basi 2-glandulosa; ovarii rudimentum turbinatum, glabrum; sepala feminei elliptico-lanceolata, glandula basali 3-loba aucta; petala oblongo-lanceolata, eglandulosa; ovarium glabrum; styli liberi, 2-fidi; capsula subglobosa, 4 mm. lata; semina nigra, nitentia. C. Alaternoides β [brevifolia], *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* c, d, e, f, *et* g (1843); *nec* C. alaternoides, β brevifolia, *E. Mey. ex Sond.* C. polygonoides, *Krauss in Flora*, xxviii. 82 (1845); *nec Linn. nec Thunb., vix Willd. vix Sond.* C. polygonoides, β foliis utrinque glaucis, *Sond.* l.c. (1850). C. Alaternoides, δ microphylla, *Müll. Arg. in DC. Prodr.* xv. 2, 1048 *partim et quoad syn. Eckl. tantum* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 70, *partim et quoad* f. 2 glauca *tantum* (1911). C. glauca, *Pax in Ann. Hofmus. Wien.* xv. 50 (1900).

Coast Region: Clanwilliam Div.; Wupperthal, *Wurmberg* (*Drège* β, letter e). Piquetberg Div.; Oliphants River Mountains behind Warm Baths, *Phillips*, 7253. Tulbagh Div.; New Kloof near Tulbagh, *Burchell*, 1016; Winterhoek Mountains, *Bolus*, 5356; Saron, 300 m., *Schlechter*. Worcester Div.; above Worcester, *Rehmann*, 2538 in part. Paarl Div.; Drakenstein Mountains, 900–1200 m., *Drège* β, letter c. Cape Div.; Table Mountain, *Ecklon*, *Krebs*, *Prior*; Cape Flats, *Bergius*, *Sparrmann*, *Ecklon*, 416; Devil's Peak, *Harvey*; between Paarden Island, Blueberg and Tygerberg, *Drège* β, letter d. Stellenbosch Div.; Stellenbosch, *Prior*; Hottentots Holland Mountain, 300 m., *Diels*, 1310. Caledon Div.; Baviaan's Kloof, near Genadendal, *Drège* β, letter f; *Ecklon*; Houw Hoek, *Bolus*, 9937 in part: near Greitjesgat, *Ecklon*. Riversdale Div.; Albertina, *Muir*. Mossel Bay Div.; Attarquai Kloof, *Gill*. George Div.; near George, 300 m., *Burchell*, 6007; *Bowie*; *Drège* β, letter g; *Penther*, 1597; *Schlechter*, 2240. Humansdorp Div.; near Humansdorp, *Rogers*, 2907 in part; 2934; 2994. Port Elizabeth Div.; near Port Elizabeth, *Ecklon & Zeyher*; *Ecklon*, 977; *Mrs. Paterson*, 1109, 2135; *Drège fil.*, 414!

Var. β. **microphylla**, *Müll. Arg.* [*sub* Alaternoides] *in DC. Prodr.* xv. 2, 1048 (1866); suffrutex prostratus, fastigiatim intricatimque ramosus; folia typi nisi multo minora, 3–6 mm. longa, 2·5–3 mm. lata. *Pax* [*sub* Alaternoides] *in Engl. Pflanzenr.* l.c. *fig.* 22 C *et quoad* f. 1, typica *tantum* (1911). C. Alaternoides β [brevifolia], *E. Mey. in Drège* l.c., *quoad* b *tantum* (1843); *nec* β brevifolia, *E. Mey. ex Sond.* C. polygonoides, *Sond.* l.c. (1850); *Baill. Adansonia*, iii. 153, *excl. syn. Willd. et syn. Burm.* (1862); *nequaquam Linn., vix Willd. vix Krauss.* C. gnidioides, *Willd. MSS. in Herb. Berol.* C. microphylla, *Burch. MSS. in Herb. Kew.* C. polygonoides, *var.* curvata, *E. Mey. MSS. in Herb. Lubeck.*

Coast Region: Malmesbury Div.; Hopefield, *Bachmann*, 115, 943. Worcester Div.; Dutoits Kloof, 600–1200 m., *Drège* β, letter b; above Worcester, *Rehmann*, 2538 in part. Stellenbosch Div.; Hottentots Holland Mountains, 300 m., *Zeyher*, 3831; *Prior.* Caledon Div.; near Genadendal, *Burchell*, 8625; Baviaan's Kloof, *Burchell*, 7667; Houw Hoek Mountains, *Burchell*, 8151; *Scott Elliot*, 1115; near Greitjesgat, 600–1200 m., *Echlon*, 52 in part; without precise locality, *Lichtenstein*; *Miss Cole.*

Var. γ, **grandifolia**, *Krauss* [*sub* polygonoides] *in Flora*, xxviii. 82 (1845); fruticulus erectus, parce ramosus ramulis ascendentibus, vel subsimplex; folia obovata versus basin cuneatim attenuata, 2–3 cm. longa, 8–10 mm. lata. C. Alaternoides, *Thunb. Prodr. Pl. Cap.* 53 (1794) et *Fl. Cap. ed. Schult.* 470, *partim* (1823); *E. Mey. in Drège* l.c. 174, *quoad* b *tantum* (1843); *nec Linn.* C. polygonoides, *Willd. Hort. Berol.* 51, t. 51 (ante 1805), et *Sp. Pl.* iv. 2, 879 (1805); *Pers. Synops.* iii. 49 (1807); *Ait. Hort. Kew*, ed. 2, v. 422 (1813); *Dietr. Synops.* v. 455 (1852); *Baill. Adansonia*, iii. 153, *quoad syn. Willd. tantum* (1862); *nec Linn.* C. Alaternoides, γ genuina, *Müll. Arg.* l.c. *quoad* b, oblongata *et* d, elliptica *tantum* (1866); Pax l.c. 68 *quoad* 1, grandifolia *tantum* (1911).

Coast Region: Clanwilliam Div.; Cedarberg, 900 m., *Diels*, 870. Cape Div.; numerous localities, *Tulbagh*, 127 *in hb. Linn.*; *Bergius*; *Lalande*; *Sieber*, 148; *Forbes*; *Dubuc*; *Miss Cole*; *Boivin*, 733; *Krebs*, 103; *Lichtenstein*; *Burchell*, 260 in part; *Spielhaus*; *Rehmann*, 974, 1271 partly; *Echlon*, 603; *Zeyher*, 3822; *Drège*, b, 138; *Schlechter*, 710, 977; *Fuller*; *Diels*, 110; *Wolley Dod*, 1209; *Wilms*, 3613, 3614, 3615; *Rogers*, 11,222. Caledon Div.; Caledon, *Echlon.* 449. Mossel Bay Div.; Attarquai Kloof, *Gill.* Humansdorp Div.; Kruisfontein Mountain, 240 m., *Galpin*, 4592.

Var. δ, **tenuifolia**, *Prain*; suffrutex erectus vel prostratus, fastigiatim intricatimque ramosus; folia lanceolato-linearia vel linearia raro anguste ovato-lanceolata vel obovato-lanceolata, acuta, basi cuneata margineque versus basin nonnunquam subinvoluta, 6–18 mm. longa, 2–3 mm. lata. C. imbricata, *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *partim et quoad* b (mas) *tantum* (1843); *nec E. Mey. ex Sond.* l.c. 125. C. tenuifolia, *Sond.* l.c. 123 (1850); *nequaquam Willd.* C. Alaternoides, ε angustifolia, b brachyphylla, *Müll. Arg.* l.c. (1866). C. Alaternoides, γ angustifolia, f. 2 brachyphylla, *Pax* l.c. *partim* (1911). C. thymifolia, *Willd. MSS. in herb. Berol.*

Coast Region: Van Rhynsdorp Div.; Giftberg, 300–600 m., *Phillips*, 7387, 7395. Clanwilliam Div.; Cedarberg, Kana Kadouw

Pass, 1170 m., *Diels*, 928. Piquetberg Div.; Mount Cango, *Mund & Maire*. Malmesbury Div.; near Hopefield, *Bachmann*, 944; between Hopefield and Langebaan, *Bachmann*, 2079, 2080; *Bolus*. Tulbagh Div.; near Tulbagh Waterfall, *Ecklon & Zeyher*. Cape Div.; without precise locality, *Tulbagh*, 113 *in herb Linn.*; *Lichtenstein*. Stellenbosch Div.; Lowry's Pass, 150 m., *Schlechter*, 1191. Caledon Div.; Klein Rivier Mountains, 300–900 m., *Ecklon & Zeyher*, 64; near Caledon, *Bolus*, 8501. Swellendam Div.; without precise locality, *Mund & Maire*. Riversdale Div.; without precise locality, *Rust*, 550. Mossel Bay Div.; Little Brak River, *Rogers*, 4213.

Central Region: Ceres Div.; slopes at Hottentots Kloof, *Pearson*, 4897. Prince Albert Div.; Zwarteberg Pass, 1500 m., *Bolus*, 12,288.

Western Region: Little Namaqualand; Khamiesberg, between Pedro's Kloof and Leliefontien, *Drège* (*C. imbricata*, b); near the summit of Beacon Hill, *Pearson*, 6710, partly.

An examination of the literary history of the species here described as *C. rubricaulis*, Eckl., a name already indirectly established by Sonder in 1850, shows that although both Linnaeus and Thunberg included it in *C. Alaternoides*, this error was avoided by their successors from Willdenow onwards. During the sixty years when this more natural view prevailed the authors who held it were misled in their supposition that this species was the plant intended by Linnaeus as *C. polygonoides*, a circumstance due no doubt to none of them having had an opportunity of seeing what the *C. polygonoides* of Linnaeus and Willdenow really is. The adoption by Müller in 1866 of the older and manifestly erroneous view of Linnaeus and Thunberg, in preference to the more matured and more natural view of Willdenow, Krauss and Sonder, was a somewhat unfortunate reversion.

In recognising a variety *microphylla* as apart from typical *rubricaulis* we have followed Sonder, and have done so more for the sake of simplifying the synonymy than because there is any real necessity for the establishment of this variety. The specimens of Ecklon show that although Sonder has limited the name *C. rubricaulis*, Eckl., to the larger leaved plant subsequently described by Pax as *C. glauca*, Ecklon really intended his name to include both what is here termed var. *microphylla* and typical *rubricaulis*. The same is true of the name *C. gnidioides*, which Willdenow proposed, but unfortunately never published, and the same is true of the name *C. microphylla*, which Burchell proposed for his n. 8151, and which Müller took up in a varietal sense under *C. Alaternoides*. The same is also true of the name *C. polygonoides* as employed by Krauss in 1843. A study of the localities whence the two forms here treated as typical *rubricaulis* and as var. *microphylla* respectively have been reported, strongly suggests that the view held by Willdenow, Burchell, Krauss and Müller is preferable to that adopted by Sonder, and that the plant here termed var. *microphylla* is merely a stunted condition of typical *rubricaulis*, not a distinct variety.

As regards var. *grandifolia* matters are different. The plant so named here is the plant which Willdenow mistook for *C. polygonoides*. When he used for what is only a form of typical *C. rubricaulis* the name *C. gnidioides*, he therefore suggested that it and what Krauss has treated as a variety of *C. polygonoides* must be specifically distinct. We have followed Krauss in thinking that after all the two are but varieties of one species, but there is no doubt that they are valid varieties. It should be noted that while Willdenow supposed the larger leafed variety to be *C. polygonoides*, Krauss supposed—equally erroneously, it is true—that the smaller leafed plant deserved that name.

The remaining variety, here termed *tenuifolia*, may, as the result of further field-study, prove to be specifically distinct from *C. rubricaulis*. It includes three quite readily distinguishable forms: (*a*) with long, narrow, linear leaves subinvolute towards the base = *C. tenuifolia*, Sond. non Willd.; (*b*) with linear-lanceolate leaves subinvolute towards the base = *C. thymifolia*, Willd. MSS.; and (*c*) with short ovate-lanceolate leaves quite flat along the margin throughout = *C. imbricata*, E. Mey., b *not* a. This last differs mainly from the true *C. imbricata*, E. Mey., a *not* b, in having flat leaf-margins, the leaf-margins of *C. imbricata* being revolute.

17. **Cluytia ovalis**, *Sond. in Linnaea*, xxiii. 129 (1850); *Baill. Adansonia*, iii. 153 (1862); *Müll. Arg. in DC. Prodr.* xv. 2, 1047 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 71 (1866). C. Alaternoides, β genuina, f. 3 elliptica, *Pax* l.c. 70, *partim* (1911); *nec Müll. Arg.*

Coast Region: Piquetberg and Tulbagh Divs.

As this form is so far known only in one sex we have followed Sonder, Müller and Pax in maintaining it as a distinct species. It may, however, prove on further field study that this is only a variety of *C. rubricaulis* differing from the type of that species in having internodes as long as, in place of much shorter than the leaves; or that it is only a variety of *C. africana* with much smaller leaves quite flat at the margin. Which of the two positions may prove the more satisfactory it is, with the material at our disposal, as yet impossible to say. Baillon in 1862 hazarded the suggestion that *C. ovalis* may not be a *Cluytia* at all; for this guess there is no justification. The original type of the species is in herb. Holm.; it matches exactly 'Schlechter 4966' which Pax has placed in *C. Alaternoides* β *genuina*, and identified with Müller's form *elliptica*—a plant which *C. ovalis*, Sond., does not closely resemble or readily recall.

¶ 4. **Impeditae**, *Prain*.—Folia haud ericoidea, membranacea, glabra, sessilia, pellucido-punctata, margine plana.—Species 1; *C. impedita*.

18. **Cluytia impedita**, *Prain*; suffrutex, caules rigidi, erecti, versus apicem copiose virgatim ramosi, 45–60 cm. alti, tereti, glaberrimi; folia brevissime petiolata, firmiter papyracea, densius imbricata, obovata apice truncata vel retusa, basi gradatim cuneata, margine plana, 8–12 mm. longa, versus apicem 6–8 mm. lata, pallide viridia, glabra, pellucido-punctata, verrucosa, costa inconspicua; petiolus 1–2 mm. longus; flores dioici maris tantum adhuc noti, solitarii vel

2-ni, punicei ; pedicelli perbreves, 1 mm. longi ; sepala maris suborbicularia, subcarnosa, glandula basali 2–4-loba aucta ; petala obovata, sensim versus basin angustata ibique glandula minutissima aucta ; ovarii rudimentum ovoideum, glabrum.

Coast Region : Queenstown Div. ; Andriesberg, near Bailey, 1900 m., *Galpin*, 2026. Cathcart Div. ; Bontebok Flats, *Sim*, 2543. Without locality, *Prior*.

A very distinct species, not particularly closely related to any other in the genus.

¶ 5. **Alpinae**, *Prain*.—Folia haud ericoidea, membranacea, parce pubescentia, petiolata, pellucido-punctata, margine parum revoluta ; glandulae maris omnes in fundo calycis sitae.—Species 1 ; *C. alpina*.

19. **Cluytia alpina**, *Prain* ; suffrutex, caules numerosi e rhizomate lignoso prostrati, 10–30 cm. longi, ramulos plures 5–15 cm. longos prostratos vel ascendentes emittentes ; ramuli angulati vel subalati, parce molliter cinereo-tomentosi ; folia petiolata, membranacea, pellucido-punctata, ovata, obtusa, basi rotundata vel truncata, margine revoluta, 8–12 mm. longa, 5–8 mm. lata, supra secus costam adpresse hirsuta ceterum utrinque glabra, nervi inconspicui ; petioli 3–4 mm. longi, pubescentes ; flores dioici, virides, maris tantum noti, in axillis 2-ni ; pedicelli brevissimi basi perulis minimis ovatis hyalinis margine versus basin ciliatis cincti ; sepala maris ovata, obtusa, intus eglandulosa ; petala spathulata, eglandulosa sed quot petala totidem glandulae in fundo calycis intra petalorum insertionem innatae reperiuntur ; ovarii rudimentum cylindricum, glabrum.

Central Region : Barkly East Div. ; Wittebergen, on Ben Macdhui, 2800 m., *Galpin*, 6827.

A very distinct species, not particularly nearly allied to any other in the genus.

¶ 6. **Pulchellae**, *Prain*.—Folia haud ericoidea, membranacea, parcius pubescentia vel glabrescentia, petiolata, pellucido-punctata vel raro (*C. affinis*) opaca, margine plana. *Pauciglandulosae*, Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt. 53, sensu strictiore (1911).—Species 5 ; *C. glabrescens*, *C. Galpini*, *C. pulchella*, *C. mollis*, *C. affinis*.

20. **Cluytia glabrescens**, *Knauf in Engl. Bot. Jahrb.* xxx. 340 (1901). C. abyssinica, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 57, *partim* (1911) ; *Hutchinson in Dyer*, *Fl. Trop. Afr.* vi. 1, 807, *partim* (1912) ; *nec Jaub. et Spach.*

Eastern Region : Zululand.

Also in Nyasaland.

The Zululand specimens of this species agree exactly with those collected on Mount Chiradzulu in Nyasaland, and with the original specimens on which *C. glabrescens*, Knauf, was based. There is no doubt that the species, which has, by Pax and also by Hutchinson, been reduced to *C. abyssinica*, Jaub. & Spach, is very nearly related to that plant, but they are so very readily distinguished that it is more convenient to adopt Knauf's view.

21. **Cluytia Galpini**, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 54 [*sub* C. pulchella] (1911) ; frutex, 1–1·5-metralis ; ramuli laeves,

juniores puberuli; folia distincte petiolata, firmiter membranacea, pellucido-punctata nec tamen verrucosa, ovata, acuta, 2·5 cm. longa, 1·2–1·8 cm. lata, juniora subtus puberula, mox glabra, pallide viridia; petioli 5–6 mm. longi; flores dioici, albi, maris in glomerulas pauciflores aggregati, feminei saepius singuli, raro 3-ni; pedicelli breves, feminei fructigeri elongati 4–5 mm. longi; sepala maris oblongo-ovata, haud verrucosa, glandula basali 3-loba aucta: petala deltoideo-ovata, in ungem latiorem angustata, basi 1-glandulosa; ovarii rudimentum sursum dilatata, glabra; sepala feminei eis maris similia nisi firmiora; petala maris nisi glandula multo minore vel omnino deficiente; ovarium glabrum; styli liberi, breviter 2-fidi; capsula 5 mm. lata, subglobosa, verrucoso-punctata; semina nigra, nitentia. *Pax in Bull. Herb. Boiss.* vi. 736, *quoad nomen sed descr. maris et spp. Galpin* 961 *exclus.* (1898). C. pulchella, γ ovalis, *Müll. Arg. in DC. Prodr.* xv. 2, 1046 (1866); *Pax in Engl. Pflanzenr.* l.c. 55 (1911). C. pulchella, f. genuina, *Pax* l.c. 54, *pro parte* (1911); *nequaquam* C. pulchella, *Linn.*

Kalahari Region: Transvaal; Pretoria and neighbourhood, *Rehmann*, 4231, 4287; *Leendertz*. 532; *Bolus*, 10839. *Wilms*, 1320 partly; *Kirk fil.*, 50; *Burtt Davy*, 7477; Wonderboompoort, *Rehmann*, 4589; Heidelberg, *Leendertz*, 1031; Boschveld, *Rehmann*, 4871; Elandsfontein near Johannesburg, 1700 m., *Gilfillan in herb. Galpin*, 1426; Rustenburg, 1400 m., *Miss O. Nation*, 52, 202; Barberton, 900 m., *Thorncroft*, 1943; without precise locality, *Wahlberg.*

Cluytia Galpini is very closely allied to *C. Whytei*, Hutchinson (Fl. Trop. Afr. vi. 1, 806) a small Nyasaland tree with much stouter branches and twigs. Among South African species it is most nearly allied to *C. pulchella*, Linn., whereof it was considered a variety by Müller in 1886, and to which it was reduced without comment by Pax in 1911. In 1898 the gathering from Boschveld cited above (*Rehmann*, 4871) was placed by Pax alongside a gathering from Barberton (*Galpin*, 961), the two being treated conjointly as the basis of a distinct species, *Cluytia Galpini*, Pax. The description of the male flowers, taken from Galpin's plant, shows that that plant is not a *Cluytia* at all, but that it is, as Pax has since pointed out (*Pflanzenr.* l.c. 83), an *Andrachne*, *A. ovalis*. But when correcting this misapprehension Pax created another one by transferring Rehmann's plant, which really is a *Cluytia*, not to *C. pulchella*, γ *ovalis*, Müll. Arg., which it exactly matches, but to the true *C. pulchella* from which it differs so greatly as to deserve specific rank. The name *C. Galpini*, as employed in 1898, applied only partly to this species; as used in 1911 it has, in one passage, been restricted entirely to this species. Seeing that the species has no earlier available name—that of *ovalis*, used for it in a varietal sense in 1866 by Müller, is precluded owing to the existence of another *ovalis* established in 1850 by Sonder—it is possible now to employ the name *Galpini* as restricted by Pax in 1911, though it is at the same time necessary to furnish an adequate description.

22. **Cluytia pulchella**, *Linn. Sp. Pl.* 1042 [Clutia] (1753) et *ibid. ed.* 2, 1475 (1763); *Burm. f. Prodr.* 27 bis [31] (1768); *Lamk, Encyc. Meth.* ii. 54 (1786); *Ait. Hort. Kew.* iii. 420 (1789); *Thunb. Prodr. Pl. Cap.* 53 (1794); *Willd. Sp. Pl.* iv. 2, 881 (1805); *Pers.*

Synops. ii. 636 (1807); *Ait. Hort. Kew.* ed. 2, v. 423 (1813); *Curtis Bot. Mag.* xlv. t. 1945 (1818); *Thunb. Fl. Cap. ed. Schult.* 271 (1823); *A. Juss. Euphorb. Gen. Tent.* t. 6, fig. 21 (1824); *Spreng. Syst.* iii. 49 (1826); *E. Mey. in Drège, Zwei Pfl. Documente*, 174, *quoad* a *tantum* (1843); *Krauss in Flora*, xxviii. 81 (1845); *Sond. in Linnaea*, xxiii. 129 (1850); *Dietr. Synops.* v. 455 (1852); *Baill. Étud. gén. Euphorb.* t. 16, fig. 6–19 (1858) et *in Adansonia*, iii. 153 (1862); *O. Kuntze, Rev. Gen. Pl.* iii. 2, 284, (1898). C. cotinifolia, *Salisb. Prodr.* 390 (1796). C. pulchella, α genuina, *Müll. Arg. in DC. Prodr.* xv. 2, 1045 (1866) *et* β obtusata, *Müll. Arg.* l.c. 1046, *partim* (1866). C. pulchella, f. genuina (*syn.* C. Galpini *et spp. omnia transvaalens. excl.*), f. macrophylla (*syn. Müll. Arg. excl.*) *et* f. obtusata (*pro parte tantum*), *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 54 (1911).

Coast Region: Cape, George, Knysna, Humansdorp, Albany and Bedford Divs.

Eastern Region: Pondoland and Natal.

Var. β **obtusata**, *Sond.* l.c. (1850); *Müll. Arg.* l.c. 1046, *pro parte maxima* (1066). C. pulchella, *E. Mey. in Drège* l.c., *quoad* b *tantum* (1843). C. microphylla, *Pax in Ann. Hofmus. Wien.* xv. 49 (1900). C. pulchella, f. genuina (*quoad Rehmann* 5912 *tantum*), f. microphylla, f. macrophylla (*quoad spp. natalens. tantum*) *et* f. obtusata (*pro parte maxima*), *Pax* l.c. (1911).

Coast Region: Uitenhage, Albany, Alexandria, Bathurst, Stockenstroom, Queenstown, and King Williamstown Divs. and in British Kaffrania.

Central Region: Somerset and Tarka Divs.

Kalahari Region: Orange River Colony, Basutoland and Transvaal.

Eastern Region: Transkei, Tembuland, Pondoland, Griqualand East and Natal.

Var. γ, **Franksiae**, *Prain*; ramuli nec verrucosi, persistenter pilis patentibus mollibus pilosi; folia tenuiter membranacea, punctata nec tamen verrucosa, ovata, subacuta, 2–2·5 cm. longa, 1·2–1·8 cm. lata, nervis supra pilosis exceptis glabra, subtus persistenter pilis patentibus mollibus hirsuta.

Eastern Region: Natal; Amazimtoti, *Miss Franks in herb. Wood*, 11,912.

This familiar plant, which has been in cultivation in Europe since the end of the seventeenth century, is one of the best known of South African species of Euphorbiaceae. It occurs in two readily separable forms which were for the first time recognised in 1850 by Sonder, and were by him treated as two distinct varieties characterised by the different shape of their leaves. This difference in form of leaf, though general, is not by any means constant, and owing to their having overlooked this fact both Müller in 1866 and Pax in 1911, while recognising the existence of Sonder's β *obtusata* have marred its natural character. They have included in it specimens which, though they have obtuse leaves, really belong to *C. pulchella* proper and they have excluded from it specimens which really belong to β *obtusata* but which do not happen to have blunt-tipped leaves.

The distinction between *C. pulchella* proper and β *obtusata*, Sond., does not depend upon the form of the leaf-blade, which may be obtuse or acute in either variety, but upon the absence from β *obtusata* of the minute warts which characterise the twigs, petioles and leaves of *C. pulchella* proper. So different are these two plants that in 1900 Pax based upon what is only a condition of β *obtusata*, Sond., a distinct species which he named *C.microphylla*; it is within the bounds of possibility that further field study on the part of South African botanists may show that Pax's action in 1900 was fully warranted. The form *macrophylla*, which, as limited by Müller in 1866, belongs to *C. pulchella* proper and, as limited by Pax in 1911, belongs equally to the type and to β *obtusata*, has no actual existence and must be eliminated. In 1866 Müller added a third variety, γ *ovalis*, which, now that more ample material is available, proves to be a distinct and valid species.

We now find it necessary to add in turn a new variety, γ *Franksiae*, which agrees with β *obtusata* in the absence of verrucosity and from both β *obtusata* and true *C. pulchella* in the character of its indumentum. But the position allocated to this plant is tentative only; it is as yet incompletely known and it is by no means improbable that, when more fully represented, it too will be found to be a distinct species.

23. **Cluytia mollis**, *Pax in Engl. Bot. Jahrb.* xix. 112 (1894) et *in Engl. Pflanzenr.—Euphorb. Cluyt.* 55 (1911); *Hutchinson in Dyer Fl. Trop. Afr.* vi. 1, 808 (1912). C. leuconeura, *Pax in Engl. Bot. Jahrb.* l.c. (1894); *fide Pax.* C. abyssinica, δ usambarica, *Pax et K. Hoffm. in Engl. Pflanzenr.* l.c. 57 (1911) *et* ε ovalifolia, *Pax et K. Hoffm.* l.c. (1911); *fide Hutchinson.*

Eastern Region: Natal; Alfred County.

Also in Tropical East Africa.

Very nearly allied to *C. pulchella*, Linn., but with leaves much larger than in that species, densely persistently velvety on the nerves beneath.

24. **Cluytia affinis**, *Sond. in Linnaea*, xxiii. 126 (1850); *Müll. Arg. in DC. Prodr.* xv. 2, 1050, *var.* β *inclus.* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 76, *var.* β *inclus.* (1911). C. hirsuta, *Eckl. et Zeyh. ex Sond.* l.c. (1850); *nec E. Mey.* C. pubescens, *Eckl. et Zeyh. partim, ex Sond.* l.c. (1850); *nec Thunb., nec Willd.* C. phyllanthifolia, *Baill. Adansonia*, iii. 153 (1862). C. retusa, *Thunb. MSS. in herb. Thunb. propr.*; *nec Linn.*

Coast Region: Stellenbosch, Swellendam, George, Humansdorp, Uitenhage, Port Elizabeth, Albany, Bedford, Stockenstroom, Queenstown, King Williamstown, East London and Komgha Divs., and in British Kaffraria.

Kalahari Region: Transvaal; Pietersburg and Lydenburg Dists.

Eastern Region: Transkei; Natal (Alexandra County), and Zululand.

A very distinct species, known first to Thunberg who supposed it to be possibly the *C. retusa* of Linnaeus—an Indian plant not now included in *Cluytia*. Like many other species of *Cluytia*, *C. affinis* has the leaves on its lateral (floriferous) twigs rather different in appearance from those on its stems and main-branches.

Baillon, like Sonder, recognised the claim of this plant to specific rank, but, not having seen an authentic specimen of *C. affinis*, supposed Sonder's plant to be the same thing as *C. hirsuta*, E. Mey., and did not discover that, as *C. phyllanthifolia*, Baill., he was only redescribing *C. affinis*, Sond. It so happens that *C. phyllanthifolia* was based on lateral twigs only, whereas Sonder's account of *C. affinis* was based on complete material. As a consequence the variety β *phyllanthifolia*, Müll. Arg. l.c. 1051 (Drège 8226 a et 8226 c nec tamen 8226 b) has no real existence.

§ II. Multiglandulosae, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 59 (1911) *ampl.*—Petala maris singula glandulis 3–10 munita; glandulae rarissime petalorum ungui adnatae, saepissime a petalo liberae et in fundo calycis sitae.

¶ 7. **Myricoideae**, *Prain.*—Folia haud ericoidea, membranacea, parcius pubescentia vel glabrescentia, petiolata, pellucido-punctata, margine plana. *Multiglandulosae*, Pax et K. Hoffm. l.c., sensu strictiore (1911).—Species austro-africana 1; *C. natalensis.*

25. **Cluytia natalensis**, *Bernh. ex Krauss in Flora*, xxviii. 81 (1845); *Sond. in Linnaea*, xxiii. 127, *var.* β *inclus.* (1850); *Baill. Adansonia*, iii. 150, *var.* β *inclus.* (1862); *Müll. Arg. in DC. Prodr.* xv. 2, 1052, *var.* β *inclus.* (1866); *O. Kuntze, Rev. Gen. Pl.* iii. 2, 284 (1898); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 64, *var.* β *inclus.* (1911). Cluytia nn. 8225, 8226 b [*nec* a], *E. Mey. in Drège, Zwei Pfl. Documente*, 174 (1843).

Coast Region: Alexandria, Albany and Queenstown Divs.

Central Region: Tarka and Aliwal North Divs.

Kalahari Region: Orange River Colony, Basutoland, and Transvaal.

Eastern Region: Tembuland, Griqualand East, Natal and Zululand.

With age the sparse tawny pubescence of *C. natalensis* almost disappears and on an adult specimen (*Zeyher* 1512 from the Caledon River) Sonder based a variety *glabrata* which has been accepted by Baillon, Müller and Pax, but which in reality has no existence.

8. **Disceptatae**, *Prain.*—Folia haud ericoidea, membranacea vel papyracea, parcius pubescentia vel glabra, sessilia vel subsessilia, pellucido-punctata, margine parum revoluta, caulibus nunc ramosis nunc e rhizomate lignoso pluribus simplicibus vel vix ramosis. *Simplices*, Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt. 65 (1911) necnon *Daphnoideae*, Pax et K. Hoffm. l.c., pro parte maxima sed *C. daphnoide*, Lamk, exclus. (1911).—Species 7; *C. platyphylla, C. Dregeana, C. hirsuta, C. disceptata, C. monticola, C. cordata, C. heterophylla.*

26. **Cluytia platyphylla**, *Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt.* 74 (1911).

Eastern Region: Natal; Alexandra County.

Cluytia platyphylla, known only from a single gathering (Rudatis, 81) and so far only incompletely collected, in foliage most resembles *C. Dregeana*, Scheele, and in male flowers most resembles *C. hirsuta*, E. Mey. For the present, and until this form becomes more fully represented in collections, it seems desirable to accord it the separate recognition claimed for it by its authors.

27. **Cluytia Dregeana**, *Scheele in Linnaea*, xxv. 513 (1852); *Baill. Adansonia*, iii. 153 (1862). C. heterophylla, *Sond. in Linnaea*, xxiii. 128, *pro parte maxima, sed syn. Bernh. et var. β exclus.* (1850); *nequaquam Thunb.* C. Sonderiana, *Müll. Arg. in DC. Prodr.* xv. 2, 1051, *var. amb. inclus.* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 72, *var. omn. inclus. sed excl. ac Krook* 915 *ac syn.* C. heterophylla, *Pax in Ann. Hofmus. Wien.* (1911). C. similis, *Pax in Engl. Pflanzenr.* l.c. 66, *partim et quoad Bachmann* 750 *tantum* (1911); *nec Müll. Arg.*

Coast Region: Uitenhage, Alexandria and Albany Divs., and in British Kaffraria.

Eastern Region: Transkei and Natal.

Cluytia Dregeana, a very distinct shrubby species, though it is one of those first collected by Drège, was not taken up by E. Meyer in 1843. In 1850, as his specimens show, this species was confused by Sonder with the subherbaceous *C. heterophylla*, Thunb., nor was it duly recognised as the separate species that it is until 1852. Müller in 1866 modified Scheele's treatment of 1852 as the result of his examination of the material in Sonder's herbarium. Into Müller's statement of this result some inadvertence has crept, because he has indicated (DC. Prodr. xv. 2, 1051) that the male and the female specimens of Drège 8229 in that herbarium belong to different species, and has asserted that the ovary in the female specimen of Drège of 8229 is not glabrous. There seems to the writer no justification for the idea that the two specimens in question are other than conspecific; the statement as regards the ovary of the female specimen of Drège 8229 is incorrect. This inadvertence on Müller's part, however, is found on examining Sonder's herbarium not to be due to any error of observation, but to be attributable either to some imperfect register of that observation or to a lapse of memory. For there is still in herb. Sonder the actual female specimen on which the description of *C. Dregeana*, Müll. Arg. l.c., not of Scheele, was based. But this female specimen was not collected by Drège, it does not bear the number 8229, and it was not named either by Scheele or by Sonder. The net outcome of Müller's misreading of labels has been that Müller, who has been followed by subsequent authors, has been led to create for *C. Dregeana*, Scheele, a new and unnecessary homonym *C. Sonderiana*, and has transferred Scheele's name to *C. Krookii*, Pax, a plant that is probably best treated as a variety of *C. hirsuta*, E. Mey. For the recognition of the two varieties proposed by Müller there is no necessity; they represent merely varying states of the same plant.

28. **Cluytia hirsuta**, *E. Mey. in Drège, Zwei Pfl. Documente*, 174 [nomen] (1843) et *ex Sond. in Linnaea*, xxiii. 129 (1850); *Müll. Arg. in DC. Prodr.* xv. 2, 1046 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 73 (1911). C. heterophylla, β hirsuta, *Sond.* l.c. (1850). C. affinis, *Baill. Adansonia*, iii. 150, *partim et quoad syn. E. Mey. tantum* (1862); *nec Sond.* C. heterophylla, *Pax in Ann. Hofmus. Wien.* xv. 49 (1900); *nec Thunb.* C. Schlechteri, *Pax in Engl. Bot. Jahrb.* xxxiv. 373 (1909). C. hybrida, *Pax et K. Hoffm. in Engl. Pflanzenr.* l.c. 60 (1911). C. Sonderiana, *a* pubescens, *Pax in Engl. Pflanzenr.* l.c. 73, *quoad Krook* 915 *tantum* (1911); *nec Müll. Arg.*

Coast Region: Uitenhage, Albany, King Williamstown and East London Divs.

Central Region; Somerset Div.

Kalahari Region: Orange River Colony and Transvaal.

Eastern Region: Transkei, Tembuland, Pondoland, Griqualand East and Natal.

Var. β **robusta**, *Prain*; caules sesquimetrales, quam ei typi manifeste crassiores, saepius minopere ramosi; folia firmiter papyracea vel subcoriacea, caulina 3·5–4 cm. long, 1·2–1·8 cm. lata, ramealia 1·2–1·8 cm. longa, 6–8 mm. lata. C. Dregeana, *Müll. Arg.* l.c. 1051 (1866); *Pax in Engl. Pflanzenr.* l.c. 74 (1911); *haudquaquam Scheele.* C. hirsuta, *O. Kuntze, Rev. Gen. Pl.* iii. 2, 284 (1898); *vix E. Mey.* C. Krookii, *Pax in Ann. Hofmus. Wien.* xv. 49 (1900) et *in Engl. Pflanzenr.* l.c. 74, *sed syn.* C. Schlechteri, *Pax excl.* (1911).

Coast Region: Uitenhage and Stockenstroom Divs., and in British Kaffraria.

Central Region: Somerset Div.

Eastern Region: Pondoland, Griqualand East and Natal.

Cluytia hirsuta is a distinct shrubby species which in habit most resembles *C. Dregeana*, Scheele, but it is readily distinguished from the latter by its more persistent pubescence, more translucent leaves, longer petioles, shorter male pedicels, pubescent ovary and capsule, and nearly free styles. The female pedicels have been described as being twice as long as the capsules; this is not the case in *C. hirsuta*, E. Mey., though it happens to be true of *C. disceptata*, the subherbaceous member of the same group of species in which the ovary and the capsules may be hirsute.

The two varieties here recognised correspond precisely with the two species *C. hirsuta* and *C. Dregeana* as these were conceived and defined by Müller. The first of Müller's species included, in addition to *C. hirsuta* as understood and distributed by E. Meyer, another form collected by Wahlberg which is identical with the plant described by Pax as *C. hybrida*, Pax et K. Hoffm. The second of Müller's species, which is altogether different from the original *C. Dregeana*, Scheele, is based upon a specimen identical with the plant subsequently described as *C. Krookii*, Pax. To his own *C. Krookii* Dr. Pax has now reduced his own *C. Schlechteri*, a step for which there is a good deal to be said though, in the writer's opinion, *C. Schlechteri* is really rather a form intermediate between *C. Krookii*, Pax (= C. Dregeana, *Müll. Arg., not of Scheele*) and the original *C. hirsuta*, E. Mey., than one which is strictly referable to either; if it be nearer to the one than to the other the affinity is closer with *C. hirsuta* than with *C. Krookii*. Under all the circumstances it has appeared preferable to follow Müller's segregation of these forms rather than to adopt the more recent modification thereof independently proposed by Pax. It must, however, be understood that the writer cannot concur with his predecessors in the view that two species, as Müller has said, or three species, as Pax has supposed, are here involved. The recognition of two varieties renders it more easy to follow and disentangle the involved synonymy, but no harm could accrue were our variety *robusta* treated as merely a form equivalent to

" hybrida " or to " Schlechteri " and merged, like them, in Meyer's original species.

28. **Cluytia disceptata,** *Prain* ; suffrutex caulibus saepissime simplicibus, raro parce ramosis ; caules e rhizomate lignoso plures, erecti, 20–60 cm. alti, sursum minopere angulati, versus basin teretes, juniores parcissime adpresse hirsuti ; folia breve petiolata, juniora membranacea, mox papyracea, pellucido-punctata et parcissime verrucosa, ima nonnunquam orbicularia sed saepius ovato-oblonga, superiora ovato-lanceolata raro omnia ovato-lanceolata, acuta, basi lata vel angustius cuneata, margine parum recurva, 1·8–3 cm. longa, 0·8–2·5 cm. lata, viridia, juniora utrinque parce hirsuta, mox glabrescens vel glabra, subtus distincte reticulata ; petiolus prope basin 2 mm. longus, superne subobsoletus, pubescens ; flores dioici, viridescentes, maris 2–4-ni, feminei solitarii vel nonnunquam 2-ni ; pedicelli 8 mm. longi, pubescentes, maris capillacei, feminei rigidi sed gracillimi, fructigeri saepe 1 cm. longi ; sepala maris ovato-oblonga, obtusa, punctata nec tamen verrucosa, glandula basali 3–5-loba aucta ; petala ovato-rotundata, in unguem latiorem angustata, eglandulosa sed glandulae circiter 25 (pro petalo 4–5) in fundo calycis intra petalorum insertionem innatae reperiuntur ; ovarii rudimentum cylindricum, glabrum ; sepala feminei oblonga, punctata, glandula basali 2-loba aucta ; petala maris vel eglandulosa vel glandula singula basali aucta ; ovarium hirsutum ; styli basi manifeste connati, sursum 2-fidi ; capsula 5 mm. lata, quam pedicellus plus quam duplo breviora, parce setosa vel glabrescens vel glabra, nequaquam verrucosa ; semina nigra, nitentia. C. pulchella, *Wood in Wood & Evans, Natal Pl.* i. 68, t. 84 (1899) ; *nequaquam Linn.* C. heterophylla, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 66, *partim et quoad syn. Wood* (1911) ; *nequaquam Thunb.*

Eastern Region : Griqualand East ; near Kokstad, 1300 m., *Tyson*, 1114, 1234. Natal ; near Durban, *Sanderson*, 661 ; *Gerrard*, 278 ; *Gerrard & McKen ; Wood*, 38, 4944 ; Inanda, *Wood*, 120 ; *Rehmann*, 8407 ; Claremont, *Schlechter*, 2942 ; Marburg, 90 m., *Rogers*, 536 in part.

This very distinct species has been referred by Medley Wood to *C. pulchella*, Linn., but differs from the latter plant in habit, in its subsessile leaves, in its many petaline glands and in its hirsute ovary. Pax, in rectifying this misapprehension, has referred the plant to *C. heterophylla*. But *C. heterophylla*, Pax is not the true *C. heterophylla*, Thunb., moreover *C. heterophylla*, Pax, not of Thunb., is itself a mixture of two species, one of which is *C. disceptata*, described above, the other being *C. monticola*, S. Moore. This last named plant is readily distinguished from *C. disceptata* by its leaves and stems, which are glabrous at all stages, and by its fruiting pedicels, which are hardly longer than the capsules.

30. **Cluytia monticola,** *S. Moore in Journ. Linn. Soc. Bot.* xl. 197 (1911) ; *Hutchinson in Dyer, Fl. Trop. Afr.* vi. 1, 803 (1912). C. heterophylla, *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 66, *partim et quoad syn. Schinz* (1911) ; *nequaquam Thunb.* Middelbergia transvaalensis, *Schinz ex Pax* l.c. (1911).

Kalahari Region : Orange Free State and Transvaal.

Eastern Region : Natal and Zululand.

Also in Rhodesia.

A very distinct species, most nearly allied to *C. disceptata* but readily recognised by its glabrous stems and leaves, and its much shorter female pedicels.

31. **Cluytia cordata**, *Bernh. ex Krauss in Flora*, xxviii. 81 (1845); *Müll. Arg. in DC. Prodr.* xv. 2, 1051 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 65 (1911). C. heterophylla, *Sond. in Linnaea*, xxiii. 128, *quoad syn. Bernh. tantum* (1850); *Baill. Adansonia*, iii. 150, *quoad syn. Bernh. tantum* (1862); *Pax* l.c., *quoad Rehmann* 7475 *tantum* (1911); *nequaquam Thunb.*

Eastern Region: Pondoland, Natal and Zululand.

Cluytia cordata is very nearly allied to *C. heterophylla*, Thunb. but is nevertheless quite easily distinguished therefrom by its larger, less rigid leaves with a less conspicuous reticulate venation beneath.

32. **Cluytia heterophylla**, *Thunb. Prodr. Pl. Cap.* 53 (1794); *Willd. Sp. Pl.* iv. 2, 881 (1805); *Pers. Synops.* ii. 636 (1807); *Poir. Encyc. Meth. Suppl.* ii. 303 (1810); *Thunb. Fl. Cap. ed. Schult.* 271 (1823); *Spreng. Syst.* iii. 49 (1826); *Sond. in Linnaea*, xxiii. 128, *pro parte minima et quoad spp. Zeyher. apud* Barkhausen *lecta, var.* β *hirsuta et syn. Bernh. exclus.* (1850); *Dietr. Synops.* v. 455 (1852); *Baill. Adansonia*, iii. 150, *pro parte et syn. Bernh. exclus.* (1862); *Müll. Arg. in DC. Prodr.* xv. 2, 1046 (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 66, *quoad syn. Thunb., syn. Willd., syn. Müll. Arg., et syn. Scheele, sed spp. omn. exclus.* (1911). C. similis, *Müll. Arg.* l.c. (1866); *O. Kuntze, Rev. Gen. Pl.* iii. 2, 284 (1898); *Pax* l.c., *pro parte maxima sed Bachmann* 750 *exclus.* (1911). C. dumosa, [*Harv. MSS. in sched.*] *Cooper ex Pax* l.c. (1911). Phyllanthus vaccinioides, *Scheele in Linnaea*, xxv. 585 (1852).

Coast Region: Uitenhage, Port Elizabeth, Bathurst, Albany, Fort Beaufort, Queenstown, Cathcart, East London and Komgha Divs.

Eastern Region: Tembuland and Pondoland.

This easily recognisable species was confused by Sonder in 1850 with three others, *C. cordata*, Bernh., *C. Dregeana*, Scheele, and *C. hirsuta*, E. Mey., all of which are equally distinct from it and from each other. By Baillon in 1862 it was confused with two of these, *C. cordata* and *C. hirsuta*, a confusion even more inexplicable than that of Sonder, when regard is had to the fact that in Baillon's opinion *C. heterophylla* was the plant he had himself in 1858 named *C. floribunda*. That plant, by most other writers, has been confused with *C. Alaternoides*; it is, as we now know, *C. africana*, Poir.

Müller in 1866 reverted once more, at least in intention, to the natural limitation of Thunberg and Willdenow and thereby dispelled the confusion created by Sonder and Baillon. But in doing this Müller created a new difficulty by recognising as a distinct species, *C. similis*, Müll. Arg., what is merely a state of *C. heterophylla*, Thunb., with somewhat thinner leaves. He has added to the difficulty by stating that *C. similis* is based upon a Cape specimen contained in "hb. kunth! ex hb. Mus. paris. in hb. berol." There is no such specimen in the Berlin herbarium now, and the writer has been assured that no such specimen can have been there when Müller examined the Berlin material of the genus, but have now disappeared. No doubt "hb. berol." is a *lapsus calami*

for some other important herbarium and the whereabouts of this missing type may yet be ascertained.* This difficulty necessarily leaves a faint shadow of doubt as to what the real *C. similis*, Müll. Arg. may be, more especially since Müller says its leaves are not punctate. Had it not been for this remark difficulty could hardly have been said to exist, for Müller has attached the name *C. similis* to very many specimens in numerous herbaria and the plant so named is, *in every instance*, the species which Thunberg named *C. heterophylla*, a circumstance which involves the further fact that in every instance the leaves of the plant named *C. similis* by Müller himself are pellucid-punctate, Pax has with justice included all the gatherings seen by him that are referable either to *C. similis*, Müll. Arg. with younger and thinner leaves, or to *C. heterophylla*, Thunb., with older and thicker leaves, in a single species. Unfortunately the name Pax has used for the species as a whole is the one proposed by Müller for its thin-leafed state ; the name *C. heterophylla*, which was first applied to the species, Pax has transferred to a mixture of two nearly allied but nevertheless quite distinct species.

¶ 9. **Daphnoideae**, *Prain.*—Folia haud ericoidea, firme membranacea vel coriacea, pubescentia vel glabra, petiolata vel sessilia, opaca, margine plana. *Daphnoideae*, Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt. 71, pro parte minima et quoad *C. daphnoiden*, Lamk, tantum (1911). *Tomentosae*, Pax et K. Hoffm. l.c. 75, pro parte minima, et quoad *C. Thunbergii*, Sond., tantum (1911). *Alaternoideae*, Pax et K. Hoffm. l.c. 67, pro parte minima et quoad *C. crassifolium*, Pax, tantum (1911).—Species 4 ; *C. daphnoides*, *C. vaccinioides*, *C. Thunbergii*, *C. crassifolia*.

33. **Cluytia daphnoides**, *Lamk, Encyc. Meth.* ii. 54 [Clutia] (1786); *Willd. Hort. Berol.* i. 52, t. 52, *syn. Comm. excl.* (ante 1805), et *Sp. Pl.* iv. 2, 880, *syn. Comm. et syn. Thunb. excl.* (1805) ; *Pers. Synops.* ii. 636, *syn. Thunb. excl.* (1807) ; *Ait. Hort. Kew*, ed 2, v. 422 (1813) ; *Spreng. Syst.* iii. 49, *syn. Thunb. excl.* (1826) ; *Krauss in Flora*, xxviii. 81 (1845) ; *Sond. in Linnaea*, xxiii. 126, *var.* β *inclus.* (1850) ; *Dietr. Synops.* v. 455 (1852) ; *Baill. Adansonia*, iii. 150 [dapnoides] (1862) ; *Müll. Arg. in DC. Prodr.* xv. 2, 1050, *var.* β *inclus. sed var.* γ *ac syn. Poir. excl.* (1866) ; *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 72, *var. amb. inclus. sed syn. Poir. excl.* (1911). C. tomentosa, *Thunb. ex Schult. in Fl. Cap. ed. Schult.* 271, *partim* (1823) ; *nec Linn.*, *vix Thunb. Prodr.* C. pubescens, *Eckl. et Zeyh. pro parte, ex Sond.* l.c. (1850) ; *nec Thunb.*, *nec Willd.* C. pulchella, *Sparrm. ex Sond.* l.c. (1850) ; *nec Linn.* C. hirsuta, *Pax in Ann. Hofmus. Wien.* xv. 49 (1900) ; *nec E. Mey.*, C. cinerea, *Burm. MSS. in herb. Paris.*

Coast Region: Malmesbury, Cape, Stellenbosch, Riversdale, Mossel Bay, George, Humansdorp, Uitenhage, Port Elizabeth, Bathurst, Albany, King Williamstown and Komgha Divs., and in British Kaffraria.

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* A parallel *lapsus* was committed by Müller (l.c. 848) in the case of *Acalypha patens*, stated to be based on a specimen at Stockholm when the collection intended was that at Copenhagen. In that case it was possible to surmise the nature of the error and to have that surmise confirmed ; in the case of *Cluytia similis* only accident can now clear up the difficulty which Müller has created.

Cluytia daphnoides, which was based by Lamarck on a Cape specimen given to him by Sonnerat, is a very distinct species. It is represented in the Linnean herbarium by an unnamed specimen, and in the herbarium of Thunberg by the male plant written up as *C. tomentosa*. Whether the female plant so written up be, as Müller stated in 1866, conspecific with the male one or, as Sonder thought in 1850, the type of a distinct species, will be discussed under *C. Thunbergii*, Sond.; it is enough to point out here that although, if Sonder's view be the more just, *C. tomentosa*, Thunb. (Prodr. Pl. Cap. 53), cannot be reduced to *C. daphnoides*, we must, even if Sonder's view be correct, cite *C. tomentosa*, Thunb. (in Flor. Cap. ed. Schult. 271) as being, at least in part, equivalent to *C. daphnoides*, because the description given includes an account of the male specimen. In the herbarium of Willdenow *C. daphnoides* is represented by a specimen (n. 10594) cultivated at Berlin and figured by Willdenow prior to 1805; this cultivated plant is rather less hairy than the wild one. Sonder in 1850 recognised two corresponding varieties; without justification, for the glabrescent plant of Willdenow is only a condition of the original plant of Lamarck. One disadvantage of Sonder's treatment is his use of a varietal name, β *incana*, for the original type. In 1866 Müller in effect reversed this arrangement by merging β *incana* in the type and recognising a variety β *glabrata*. Even so, however, matters are little improved, since Willdenow's n. 10594, which is not distinguishable from Müller's β *glabrata*, has been incorporated by Müller in his var. *a genuina*. The truth is that there are not two varieties and the names *incana* of Sonder, *glabrata* of Müller, are equally unnecessary. The synonym of Thunberg which Sonder has excluded is not cited in the only work to which Sonder refers; it is cited in the *Species Plantarum* which Sonder does not quote. Sonder was justified in excluding this synonym, but he overlooked the fact that Poiret in 1810 had excluded, with equally good reason, the synonym of Commelin, cited by Willdenow in both of his works. Poiret unfortunately made the converse mistake of thinking *C. daphnoides*, as figured by Willdenow, to be different from *C. daphnoides* as described by Lamarck. But this error, as has already been pointed out, does not justify Müller in reducing *C. africana*, Poir., to *C. daphnoides*, Lamk.

34. **Cluytia vaccinioides**, *Prain*; fruticulus valde ramosus; rami prostrati, 30–60 cm. longi, minute pubescentes; folia coriacea, sessilia vel subsessilia, elliptica vel oblonga, saepissime obtusa, basi late cuneata vel rotundata, margine plana, inferiora 1·2 cm. long, 8 mm. lata, cetera sursum gradatim minora, pilis paucis secus costam supra exceptis glabra, utrinque praesertim juniora distincte verruculosa, opaca, margine subhyalina; flores dioici, lutescentes, maculis coccineis notata, in axillis solitaria; pedicelli maris calycem subaequantes, parce pubescentes; sepala maris parce hirsuta, obovata minopere retusa, 4 mm. longa, glandula basali alte 3-loba aucta; petala manifeste unguiculata, obcordata, retusa, calyce breviora, glabra, singula glandulis minutis 3 ipso basi induta; ovarii rudimentum brevissimum, glabrum; flores feminei ignoti. C. Thunbergii, β vaccinioides, *Pax et K. Hoffm, in Engl. Pflanzenr. —Euphorb. Cluyt.* 76 (1911).

Coast Region: Riversdale Div.; near Riversdale, *Rust*, 619, 620. Mossel Bay Div.; between Little Brak River and Hartenbosch, *Burchell*, 6216.

As regards foliage *C. vaccinioides* is almost exactly intermediate between *C. crassifolia*, Pax and *C. Thunbergii*, Sond., of which latter species Dr. Pax has treated it as only a variety.

35. **Cluytia Thunbergii**, *Sond. in Linnaea*, xxiii. 130 (1850); *Baill. Adansonia*, iii. 152 (1862); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 76, *var.* β *exclus.* (1911). C. tomentosa, *Thunb. Prodr. Pl. Cap.* 53 (1794) et *Fl. Cap. ed. Schult.* 271, *quoad spp. fem.* (1823); *E. Mey. in Drège, Zwei Pfl. Documente*, 174 (1843); *nec Linn.* C. pubescens, *Willd. Sp. Pl.* iv. 2, 881 (1805); *Pers. Synops.* ii. 636 (1807); *Poir. Encyc. Meth. Suppl.* ii. 303 (1810); *Spreng. Syst.* iii. 49 (1826); *Dietr. Synops.* v. 455 (1852); *nec Thunb.* C. daphnoides, γ Thunbergii, *Müll. Arg. in DC. Prodr.* xv. 2, 1050 (1866). C. karreensis, *Schlechter MSS. ex Pax*, l.c. (1911).

Central Region: Prince Albert, Beaufort West and Fraserburg Divs.

Western Region: Little Namaqualand.

Cluytia Thunbergii was in 1843 tentatively identified by E. Meyer with *C. tomentosa*, Linn., a species from which this differs in having a glabrous ovary and more numerous petaline or intrapetaline glands. Sonder in 1850 described the species for the first time, and applied the name it now bears because of his belief that this is the plant described in Schultes' edition of Thunberg's *Flora Capensis* as *C. tomentosa*. According to Müller, however, the *C. tomentosa* of the work in question is *C. daphnoides*, while the *C. tomentosa* of E. Meyer is only a variety of *C. daphnoides*. The truth appears to lie somewhere between these two views. The description of *C. tomentosa* given in the *Flora Capensis* certainly accords with that of *C. daphnoides*, Lamk; moreover, of two specimens, a male and a female, written up as *C. tomentosa* in herb. Thunberg, the male certainly is *C. daphnoides*, Lamk. But the female specimen is not quite like the male; it has very much shorter leaves and resembles the *C. tomentosa* of E. Meyer—the *C. kareensis* of Schlecter, more closely than it does *C. daphnoides*. Sonder was not the only botanist to arrive at this conclusion. There is a specimen in herb. Willdenow (n. 18599) of the same form as is represented by the female sheet of *C. tomentosa*, Thunb., not of Linn. Willdenow knew and figured *C. daphnoides*, Lamk, yet it did not occur to him to include this short-leafed plant in Lamarck's species; he described it as *C. pubescens* under the mistaken impression that it might be Thunberg's species so named. There is also a specimen in herb. Linnaeus of the plant collected by Thunberg as well as one of the true *C. daphnoides*, Lamk; it did not occur to Linnaeus that the two are conspecific. Linnaeus never did give a name to his specimen of *C. daphnoides*; his specimen of Thunberg's female plant he wrote up as *C. tomentosa*, Mant. *femina*, a species which he had described in 1771 from a male specimen only, but which is very different from this one.

In dealing with this problem Pax has adopted a middle course. The *C. tomentosa* of Thunberg he has, following Müller, merged

wholly in *C. daphnoides*; the *C. tomentosa* of E. Meyer he has, following Sonder, maintained as a species apart. The disadvantage of this treatment appears in connection with the female portion of *C. tomentosa* Thunb., which certainly cannot be merged in *C. daphnoides*. Neither can it, unequivocally, be merged in *C. Thunbergii*. This female plant appears to be rather a form intermediate between *C. daphnoides*, Lamk, and *C. Thunbergii*, Sond., with the fruits of the former and the foliage of the latter, and the most natural course may therefore be to follow Müller in treating *C. Thunbergii* as a variety of *C. daphnoides*, but in recognising the female portion of *C. tomentosa*, Thunb., not of Linn., as a distinct variety differing from, and at the same time linking up, both *C. daphnoides* and *C. Thunbergii*. One difficulty which impedes a final settlement is that there is no clue to the particular area whence the specimens in herb. Linnaeus, herb. Thunberg and herb. Willdenow were obtained. In spite of the same plant having found a place in each of these herbaria no one appears ever to have collected it in South Africa again. For the moment therefore it appears better to follow Sonder in his treatment than to adopt that of Müller and of Pax. If the latter should prove to have taken the more natural view, the synonym *C. pubescens* with all its citations and the synonym *C. tomentosa*, as used by Thunberg but not as used by E. Meyer, will require to be transferred to *C. daphnoides*.

36. **Cluytia crassifolia**, *Pax in Bull. Herb. Boiss.* vi. 736 (1898), et *in Engl. Pflanzenr.—Euphorb. Cluyt.* 71 (1911).

Western Region: Great Namaqualand.

Cluytia crassifolia has been compared by its author with *C. Alaternoides*, but the arrangement of its intrapetaline glands is such as make its association with that species and with the section *Alaternoideae* rather unsatisfactory. On the other hand, but for a difference in the rudimentary ovary of the male flower, it might be easy to mistake this species for a glabrous state of *C. Thunbergii*, Sond.

¶ 10. **Polygonoideae**, *Prain.*—Folia ericoidea, coriacea, glabra, nitentia, supra convexa, subtus margine revoluta. *Revolutae*, Pax et K. Hoffm. in Engl. Pflanzenr.—Euphorb. Cluyt. 77, pro parte minima et quoad *C. polygonoiden* tantum.—Species 1; *C. polygonoides*.

37. **Cluytia polygonoides**, *Linn. Sp. Pl.* ed. 2, 1475 [Clutia] (1763); *Burm. f. Prodr.* 27 bis [31] (1768); *Lamk, Encyc. Meth.* ii. 54 (1786); *Thunb. Prodr. Pl. Cap.* 53 (1794), et *Fl. Cap. ed. Schult.* 270 (1823); *Müll. Arg. in DC. Prodr.* xv. 2, 1054, *var. amb. incl.* (1866); *Pax in Engl. Pflanzenr.—Euphorb. Cluyt.* 78 *var. amb. incl.* (1911). C. Alaternoides, *Linn. Sp. Pl.* 1042, *partim et quoad Burm.* t. 43, fig. 3 *tantum* (1753). C. tabularis, *Eckl. Un. It.* 199 [nomen] (1832); *Eckl. et Zeyh. ex Sond.* l.c. (1850). C. curvata, *E. Mey. in Drège, Zwei Pfl. Documente*, 174 [nomen] (1843). C. ericoides, *E. Mey.* l.c., *partim* (1843), *Krauss in Flora*, xxviii. 82 (1845); *Eckl. et Zeyh. ex Sond. in Linnaea*, xxiii. 122 (1850); *nequaquam Thunb.* C. diosmoides, *Sond.* l.c., *var.* β *inclus.* (1850); *Baill. Adansonia*, iii. 152, *var.* β *inclus.* (1862). C. daphnoides, *Eckl. et Zeyh. ex Sond.* l.c. (1850); *nequaquam Lamk.*

Coast Region: Clanwilliam, Malmesbury, Tulbagh, Worcester, Paarl, Cape, Stellenbosch, Caledon, Swellendam, Riversdale, Mossel Bay and (according to Ecklon and Zeyher) also Cathcart Divs.

Cluytia polygonoides is the plant figured by Burmann in 1738 (Pl. Afr. Rar. 48, t. 43, fig. 3) which Linnaeus in 1753 included in *C. Alaternoides*, but to which, in 1763, he accorded the status of a distinct species, while at the same time leaving it also in its old place. It is the *C. polygonoides* of the younger Burmann, of Lamarck and of Thunberg, but, as the outcome of a misapprehension, is not the *C. polygonoides* of Willdenow, whose plant (herb. Willd. n. 18593) is what we have here described as *C. rubricaulis*, Eckl., γ *grandifolia*, Krauss. This misinterpretation by Willdenow had been adopted by Poiret, Aiton, Sonder, Krauss and Baillon and was not cleared away until 1866 when Müller once more placed the species on a sound footing. Linnaeus not only left the plant in two places (Sp. Pl. ed. 2, 1475), his herbarium shows that he included under the name two species, one sheet written up by him as *C. polygonoides* being *C. ericoides*. The specimens of Drège issued by E. Meyer show the converse confusion, both *C. polygonoides* and *C. ericoides* having been distributed in 1843 under the latter name. Two years later Krauss repeated this error but in a modified fashion, for he treated these two species as varietally separable; *C. ericoides*, Krauss, is really *C. polygonoides*, what Krauss has issued as *C. ericoides*, var. *minor*, being really *C. ericoides*. While there is no doubt, from the specimens in his herbarium, that this is *C. polygonoides* as understood by Thunberg, the statement made in the description edited by Schultes that the leaves of this species are petioled requires qualification. The leaves are articulated at their organic base to a rather distinct pulvinus, but they cannot properly be described as stalked. The names *C. tabularis*, Eckl., and *C. diosmoides*, Sond., in themselves unexceptionable, do not require to be taken up, they were only given because their authors both believed that the name *C. polygonoides* belonged by right to the plant figured as such by Willdenow. There is some reason to suppose that the name *C. curvata*, employed by E. Meyer, was used for the same reason, because it seems possible that the mixture of *C. polygonoides* with *C. ericoides* under the latter name was the result of inadvertence rather than of misapprehension. Sonder and Baillon, Müller and Pax have, however, thought differently, and have treated *C. curvata*, E. Mey., as a distinct variety. For this there seems no justification, the form in question is merely a condition, not a variety. There is, in herb. Stockholm, a specimen somewhat different in facies from any other known one, which has been written up by Sonder "transitus in var. curvatam." It is marked 'Ecklon and Zeyher n. 51' and ought therefore to be from somewhere "between Windvogelberg and the Zwartkei River" in Cathcart Division. No other collector has found the plant in a locality so far to the east, and this record should be treated, until further evidence is available, as a rather doubtful one.

LXI.—MISCELLANEOUS NOTES.

Mr. George Stephen Crouch, until recently a member of the gardening staff of the Royal Botanic Gardens, has been appointed, on the recommendation of Kew, an Assistant Director of Horticulture in the Egyptian Department of Agriculture.

Mr. Thomas Henry Parsons, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Curator of the Royal Botanic Gardens, Peradeniya, Ceylon, in succession to Mr. H. F. Macmillan (*K.B.*, 1895, p. 155) who has been appointed Superintendent of Horticulture in the Department of Agriculture, Ceylon.

Mr. C. E. F. Allen, formerly a member of the gardening staff of the Royal Botanic Gardens (*K.B.*, 1904, p. 13) has been appointed Curator of the Botanic Garden, Port Darwin, Northern Territory, South Australia, in succession to Mr. N. Holtze, deceased (*K.B.*, 1913, p. 233).

Botanical Magazine for December.—The plants figured are *Morenia corallina*, Karst. (t. 8527); *Genista hispanica*, Linn. (t. 8528); *Rhododendron nigropunctatum*, Bur. et Franch. (t. 8529); *Derris oligosperma*, K. Schum. et Lauterb. (t. 8530) and *Cirrhopetalum Mastersianum*, Rolfe (t. 8531).

The volume for the year, which concludes with this number of the Botanical Magazine, is dedicated—"To Sir Frank Crisp, Baronet, of Friar Park, Henley-on-Thames, whose interest in the objects to whose services this work is devoted is only equalled by his generosity to the Institution wherein it is prepared."

Morenia corallina is a Colombian species of this small genus of graceful Andine Palms. The genus is closely allied to *Chamaedorea*, Willd., but is easily distinguished in having a three-toothed in the place of an annular or patelliform calyx in the male flower. The Kew plant which supplied the material for the illustration has been in cultivation for many years, and thrives well in the moist conditions of the Aroid House.

Genista hispanica has long been a favourite garden shrub in Southern England. Its native habitat extends from Portugal to Liguria in North-Western Italy and it is most nearly allied to *G. gibraltarica*, DC. and *G. decipiens*, Spach. From the former it is distinguished by the shorter and denser inflorescence, from the latter by the subequal petals. The plant figured was grown in the open at Kew.

The tiny *Rhododendron nigropunctatum* is one of the small species found on grass lands on the mountains of Szechuan in Western China at elevations of from 10,000–15,000 feet. It was collected in this region by Mr. E. H. Wilson, though it had previously been found by French travellers and described from their specimens. The plant which furnished material for the figure was presented to

Kew by Messrs. Veitch in 1910, and although then eight years old was only ten inches high. *R. intricatum*, Franch., is most nearly allied to *R. nigropunctatum*.

Derris oligosperma, a member of the *Brachypterum* section of the genus, is a powerful woody evergreen climber which has been in cultivation in the Temperate House at Kew for over twenty-five years. It was raised from seed sent from the Richmond River in New South Wales, and on flowering in 1904 was described as a new *Wistaria*. On fruits becoming available its true position was apparent, and it was found to be identical with the species which has been generally accepted by botanists interested in Australian plants as *D. scandens*. It is not, however, the true *D. scandens* of India and Indo-China, but a distinct species, and may be regarded as its south-eastern representative.

The *Cirrhopetalum* was first introduced from the Dutch East Indies by Messrs. Linden of Brussels. It flowered in June, 1890, and was named in compliment to the late Dr. M. T. Masters. The plant figured was received at Kew from the Royal Botanic Gardens, Glasnevin, in 1903. *C. Mastersianum* is very distinct from the majority of the species of this genus in cultivation; it is most nearly comparable with *C. gamosepalum*, Griff., but is quite different in colour and has the ciliae of the petals and dorsal sepal very minute.

Hibiscus asper.—Described in 1849 by J. D. Hooker (Niger Fl. p. 228) from an imperfect specimen collected in Sierra Leone, *H. asper* was reduced along with other species to *H. cannabinus* by Masters in 1868 (Fl. Trop. Afr. vol. i. p. 204). Hochreutiner in 1900 went even further in extending the limits of *H. cannabinus*, which he regarded as being very variable (Annuaire Conserv. & Jard. Bot. Genève, vol. iv. p. 114). Study of the material now contained in the Kew Herbarium shows that *H. asper* can be distinguished from *H. cannabinus* by several characters which, taken together, seem to warrant its restoration to specific rank, namely, the repand lobing of the leaf segments, the small subglobose capsule, and the smaller, more rounded, minutely and densely tubercled seeds with a setose sinus. The synonymy and distribution of *H. asper* are as follows:—

Hibiscus asper, *Hook. f.* in Hook. Niger Fl. p. 228. *H. cannabinus*, Mast. in Oliv. Fl. Trop. Afr. vol. i. p. 204, pro parte; Hochreutiner in Annuaire Conserv. & Jard. Bot. Genève, vol. iv. p. 114, parte minima.

Tropical Africa. Sierra Leone: without locality, *Miss Turner*; common on open grassy ground, near Mahela, *Scott Elliot* 4041; Scarcies, in alluvium of Kora, *Scott Elliot* 4592. French Guinea: Kouria, *Chevalier* 14,909. Dahomey, *Burton*. Northern Nigeria: Nupe, *Barter* 1026; Katagum District, common in the bush, *Dalziel* 65 (mixed with *H. cannabinus*); Zungeru, *Dalziel* 128; Sokoto Province, in damp ground and waste places, *Dalziel* 426. Lagos, *Higginson* 11. Southern Nigeria, *Foster* 362. Jur: Great Seriba Ghattas, *Schweinfurth* 2374.

Nyasaland: abundant near the foothills of the Liwonde District (infructescence received from Imperial Institute). Portuguese East Africa: Shamo, *Kirk*.

MADAGASCAR. Beravi, *Hildebrandt* 3086; without locality, *Grevé*, 166.

H. asper grows to a height of about 5 feet, and, like *H. cannabinus*, has yellow flowers with a red centre (*Higginson*). It is known under the following native names: yakuar kwadi (N. Nigeria, Katagum District), karama mowa (N. Nigeria, Sokoto District), pode agageru (Lagos), awon ekim (Lagos), keke (S. Nigeria). According to Higginson, a good fibre about five feet long is obtained from it in Lagos. *H. asper* is possibly identical with *H. obtusatus*, Schum. & Thonn. (Beskr. Guin. Pl. p. 321), judging from the description of the latter species, which was also reduced to *H. cannabinus* by Masters (Fl. Trop. Afr. vol. i. p. 204).

T. A. S.

Burmese Woody Plants.*—Since the publication of Kurz's well known Forest Flora of British Burma no exhaustive work dealing with the woody plants of Burma has appeared. The first part of the present work is devoted to a list of the woody plants of Burma arranged after the Flora of British India except that the species under the genus are arranged alphabetically. In parallel columns are given the habit of the species whether tree, shrub, climber, epiphyte, &c., and also the native names in the various districts where known. In the second part we have a vernacular-botanical index to the Burmese, Kachin, Karen and Shan names as also a reference to the page on which the species may be found in the first part.

Mr. Lace who has been an ardent collector and has always taken a keen scientific interest in his work is to be congratulated on the thoroughness of this very useful pocket book.

W. G. C.

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* List of Trees, Shrubs and Principal Climbers, etc., recorded from Burma, with Vernacular Names, by J. H. Lace, F.L.S., Chief Conservator of Forests.

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